QUARTZ AND QUARTZITE AS LITHIC RAW MATERIALS IN THE HUNGARIAN PALAEOLITHIC•

KVARC ÉS KVARCIT MINT KŐ-NYERSANYAG A MAGYARORSZÁGI PALEOLITIKUMBAN

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„A man of knowledge lives by acting, not by thinking about acting,

nor by thinking about what he will think when he has finished acting."

– Carlos Castaneda, The Teachings of Don Juan: A Yaqui Way of Knowledge

Abstract

Due to the petrological features and the inferior knapping quality, quartz and quartzite were regarded as secondary lithic sources. Since the low morphological standardization of the products made of these raw materials cannot enable a simple, easy „technological reading", for a long time the analysis of lithic tools made of quartz and quartzite was not as intensive as of others made of better quality raw materials. Furthermore, during the analyses, an attempt was generally made to generalize the technical criteria associated with different siliceous raw materials to quartz and quartzite. This phenomenon is the so-called „flint syndrome", the use of a flint artefact typology for the analysis of quartz or quartzite assemblages without taking into consideration the raw material differences. Only in the last decades has the erroneous, inadequate aspect of this approach been realized by specialists. It is only in these recent years that specific attention has been paid to these raw materials, systematic research has begun in countries where the one or the other raw material plays a significant role in the lithic stone industries. In the research of the Hungarian Palaeolithic, the judgement of these raw materials has been always rather controversial. The primary goal of this paper is not a detailed discussion of Hungarian Palaeolithic sites, but merely to raise awareness of this problem associated with these raw materials and perhaps altering their perception. The following short overview of the archaeological sites is not exhaustive, can be regarded only as indicative.

Kivonat

A kvarcot alacsonyabb rendű pattintási minősége miatt hagyományosan egy másodrangú kőeszköznyersanyagnak tekintették. Miután az ásványtani illetve kőzettani jellemzőik és a belőlük készült termékek alacsony morfológiai standardizációja megnehezíti az alkalmazott kőpattintási technológia meghatározását, így a kvarc és kvarcit eszközök vizsgálatával nagyon sokáig nem foglalkoztak olyan intenzíven, mint más, jobb minőségű nyersanyagból készült eszközökével. Rádásul a vizsgálatok során általában megpróbálták a különböző kovafféleségekkel kapcsolatos technikai kritériumokat a vizsgálandó kvarc illetve kvarcit nyersanyagokra kiterjeszteni. Ennek a megközelítésnek a hibás, elégtelen volta csak az elmúlt évtizedekben vált nyilvánvalóvá a szakemberek számára. Ekkor kezdtek megkülönböztetett figyelmet szentelni ezeknek a nyersanyagoknak, akkor indult meg a szisztematikus kutatásuk azokban az országokban, amelyek kőiparaiban jelentős szerepet játszik egyik vagy másik nyersanyag. A hazai paleolitikumban is meglehetősen ellentmondásos ezeknek a nyersanyagoknak a megítélése. A cikk elsődleges szándéka nem lelőhelyeink részletes tárgyalása, hanem csupán a nyersanyagokkal kapcsolatos probléma felvetése és ez által talán a róluk alkotott kép módosítása. Így lelőhelyeink rövid ismertetetése inkább jelzésértékűnek tekintendő.

KEYWORDS: RAW MATERIAL UTILIZATION, QUARTZ, QUARTZITE, NORTHERN HUNGARY, PALAEOLITHIC

KULCSSZAVAK: NYERSANYAGFELHASZNÁLÁS, KVARC, KVARCIT, ÉSZAK-MAGYARORSZÁG, PALEOLITIKUM

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Introduction

In 1990 and 1992 short excavations were carried out at Püspökhatvan–Diós and Püspökhatvan–Öregszőlők Upper Palaeolithic sites. The radiocarbon dating of the latter site (27.700 ± 300 BP (Deb-1901)) places the site in the elder, blady phylum of the Gravettian entity (Cs. Balogh & Dobosi 1995, 37-38, 57). In the course of the excavations, in the surrounding area, limnic quartzite banks were found, which served as raw material for the atelier sites. After the excavations in collaboration with the archaeologists A. Markó (Hungarian National Museum, Budapest), K. Zandler (Ferenczy Museum Center, Szentendre) and the author, systematic field surveys had begun in the area of the Cserhát Mountains. Since the above-mentioned Palaeolithic sites were the first ones located in the region, the primary goal of these field surveys was to localize new Palaeolithic sites. The secondary goal was to localize and document possible raw material sources.

The first significant results, on the utilization of nummulitic chert in the Middle Palaeolithic, were published yet (Markó & Kázmér 2004). The results on the utilization of some non-flint lithic raw materials will be published before long (Péntek, in prep. 1). This paper will try after to give a general summary of the utilization of quartz and quartzite as lithic raw materials.

Because of the low morphological standardization of the products made of these raw materials, for a long time, the technological and typological analysis of lithic tools made of quartz and quartzite was fading into the background. Furthermore, during the analyses, an attempt was generally made to generalize the technical criteria associated with different siliceous raw materials to quartz and quartzite. This phenomenon is the so-called „flint syndrome“ (after Knutsson 1998, 78, Beardsell 2013, 66). This term refers to the “automatic use of an ill-fitting flint artefact typology” in which quartz assemblages are approached in the same way as chert and flint ones while failing to take raw material differences into account (Beardsell 2013, 94). The difficulties in the analysis of the artefacts made of quartz or quartzite have among others a plain enough reason. The processing of pebbles, primarily quartz and quartzite pebbles is closely related to the bipolar-on-anvil technique. The anthropogenic origin of the individual artefacts is often unclear, and the knapping stigmas for these raw materials are slightly different from those commonly occurring for different silica-containing raw materials. The characteristics observed in the fragments are highly dependent on the type and quality of the raw material selected and the applied bipolar technique (horizontal/vertical straight or oblique). In the case of quartz and quartzite, due to the fracture properties of the raw material, the incidence of Siret fractures (Inizan et al. 1999, 156) is high (Mourre 1994, 18), and there is a high incidence of step and hinge fractures (Mourre 2004). As a result, the application of bipolar technique on quartz or quartzite results in a large variety of non-standardized by-products - large pieces of irregular shape and size, basal and parasitic flakes, irregular fragments, most of which are involuntary and uncontrolled by the knapper (Leaf 1979: 39).

In the first part of the paper, the discussed raw materials will be described briefly, focusing primarily on the flaking qualities of them. At the beginning of the second part, as a short by-pass, the results of M. Gutay (2007) and the author at the southern foothills of the Mátra Mountains, mainly the Gyöngyös area will be reviewed. At the end of this part, the archaeological sites, localized during the field surveys in Nógrád County, especially in the Cserhát Mountains, with documented utilization of quartz and quartzite will be described.

All data, stemming from previously published papers will be summed up in the Supplementary Materials.

Quartz and quartzite as lithic raw materials

To get the sufficient geological and archaeological background to understand the characteristics of quartz and quartzite, we leaned mainly on the papers of Vincent Mourre (1994; 1996; 2004), Arturo de Lombera Hermida (2008; 2009), and the doctoral thesis of Killian Driscoll (2010).

The basis of the followings was given by K. Driscoll (2010, 5-8), with some extensions, therefore. only papers of other authors will be signed distinctively.

Quartz is silicon dioxide (SiO_2), a significant component of many igneous, sedimentary, and metamorphic rocks, such as sandstone, quartzite etc. (Bons 2001). Quartz is a hard but brittle mineral which makes it suitable for forming into stone tools and subsequent use. In terms of fracturing, almost all quartz does not exhibit cleavage, which means it does not have a tendency to break along structural planes in the crystal structure but is instead characterised by conchoidal fracturing. It means that its fracture surface has a curved shape. Miikka Tallavaara and colleagues noted that “the fracture surfaces are often noticeably rugged in quartz than in flint” (2010, 2442). The fracture path is more unpredictable and internal flaws set up small cracks to form on either side of the main fracture (Cotterell & Kamminga 1987, 678). Quartz flakes have a high fragmentation tendency. Probably reasons can be such properties as the relatively low tensile and compressive strength and its fairly high amount of

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internal flaws (Domanski et al. 1994, 197-198; Tallavaara et al. 201, 2443)

Quartz can be broadly divided into cryptocrystalline (or microcrystalline; extremely fine-grained dense and compact forms) and macrocrystalline forms (varieties that develop visible crystals or are made of large intergrown crystals). The modern classification scheme of quartz, taking into consideration the structure and physical properties creates two types: quartz (macrocrystalline quartz) and chalcedony (cryptocrystalline quartz) (e.g. Götze 2010, 166 Fig. 2). The "grainy" varieties of cryptocrystalline quartz include flint, chert, and jasper, and are described as rocks instead of minerals (as they have less SiO2 in their composition). The conchoidal fracturing of the cryptocrystalline materials happens at the micro-scale of the individual quartz crystals and the macro-scale, following a fractal pattern. Macrocrystalline forms include vein quartz and rock crystal, while the artefacts made of them will be referred to as 'lithics' and 'stone tools' in archaeological parlance, they are in fact minerals. The fracturing at the micro-scale is conchoidal, but a fractal pattern may or may not be produced depending on how the crystals have aggregated.

Quartzite is general petrological term indicating metamorphosed sandstone mainly or entirely composed of quartz, a silica mineral. Various materials and individual quartz grains are welded together by an amorphous silica filling to form quartzite. The quartz content exceeds 90 per cent in most quartzites. In other words, quartzite is an altered sandstone, "that has been recrystallized by the heat of volcanic activity occurring near the sediment or strengthened by silica filling the small spaces between grains" (Cotterell & Kamminga 1990, 129). Generally, there are two varieties of quartzites in terms of metamorphism, metaquartzite and silicified sandstone, known as orthoquartzite, although it is often difficult to distinguish them. Orthoquartzites are have not undergone metamorphosis. Quartz grains are interlocked and hardened by a cementing process in orthoquartzites, and fracture happens along the internal cement interstices between the individual quartz grains. If the grains are fine and there are few internal flaws, a more or less conchoidal fracture can be obtained. Metaquartzites represent metamorphosed sandstone in which particles of quartz were deformed and interlocked. "… the individual quartz sand grains were welded together by later heat and pressure, so that instead of breaking between grains, which prevents conchoidal fracture, it now can be knapped across grains ... " (Whittaker 1994, 72). And according to William Andrefsky, Jr., "Fine-grained quartzites tend to fracture with more control than the larger-grained quartzites and are more suitable for flintknapping" (1998, 54-55) (Seong 2004, 77).

Quartz and quartzite utilization in the surroundings of Gyöngyös (Heves County)

M. Gutay in her unpublished thesis (Gutay 2007), reviewing the results of the field surveys performed with Gy. Kerékgyártó mentioned two quartzite artefacts with further elaboration. One of the artefacts is an unspecified, manufactured quartzite pebble at the Gyöngyöspata 5 (Dobogó) site (**Fig. 3.,** Q-7). Among the lithic artefacts, the limnic silicite waste products dominate, there are some retouched flakes, and two side-scrapers as well. Because of the lack of culture-specific tools, the cultural affiliation of the site is not clear (Gutay 2007, 70). The other artefact is a bifacially elaborated massive demi-Quina type side-scraper of big dimensions (78×53×18 mm). It is a stray find from the plateau above the diatomaceous earth quarry in Szurdokpüspöki (Western Mátra Mountains) (Gyöngyöspata 53 site (**Fig. 3.**, Q-8); Gutay 2007, 96, Table XLIX,1.). It is a Middle Palaeolithic tool, its occurrence as stray find can be explained by the presence of raw material, mainly limnic opal, in large amounts.

György Lengyel and colleagues, in their paper (Lengyel et al. 2006) described the surface collections of the Aurignacian sites Nagyréde 1 (Öreg- hill; (**Fig. 3.**, Q-11)) and Nagyréde 2 (Vájsz-lane; (**Fig. 3.**, Q-12)) near Gyöngyös, at the southern foothills of the Mátra Mountains. In Table 1, summarizing the raw material distribution of the sites, quartzite was referred to as a raw material of unknown origin. Though the percental ratio of quartzite is low (0.2%) at both sites, at Nagyréde 1 both quartzite artefacts are tools (1.8% of the 112 tools), and at Nagyréde 2 site one of the two quartzite artefacts is a tool (1.3% of the 79 tools) (Lengyel et al. 2006, 80, Table 1. and 81, Table. 3.). The typological character of the tools was not specified in further detail. The likely origin of the quartzite pebbles is a nearby gravel exposure. It is noteworthy to mention the occurrence of nummulitic chert at these sites (personal notification of A. Markó).

Between 2016 and 2019, the author of this paper initiated the complete topographic documentation of the Nagyréde 1 and 2 sites. All artefacts, regarded as archaeologically relevant, retouched tools, blades and technological markers (such as crested blades, core rejuvenation flakes, burin spalls) have been recorded with handheld GPS. With this method, on the ground of the recorded artefact distribution, in a GIS (Geographical Information System) model the estimation of the approximate extension of the sites, actually site-complexes, was possible.

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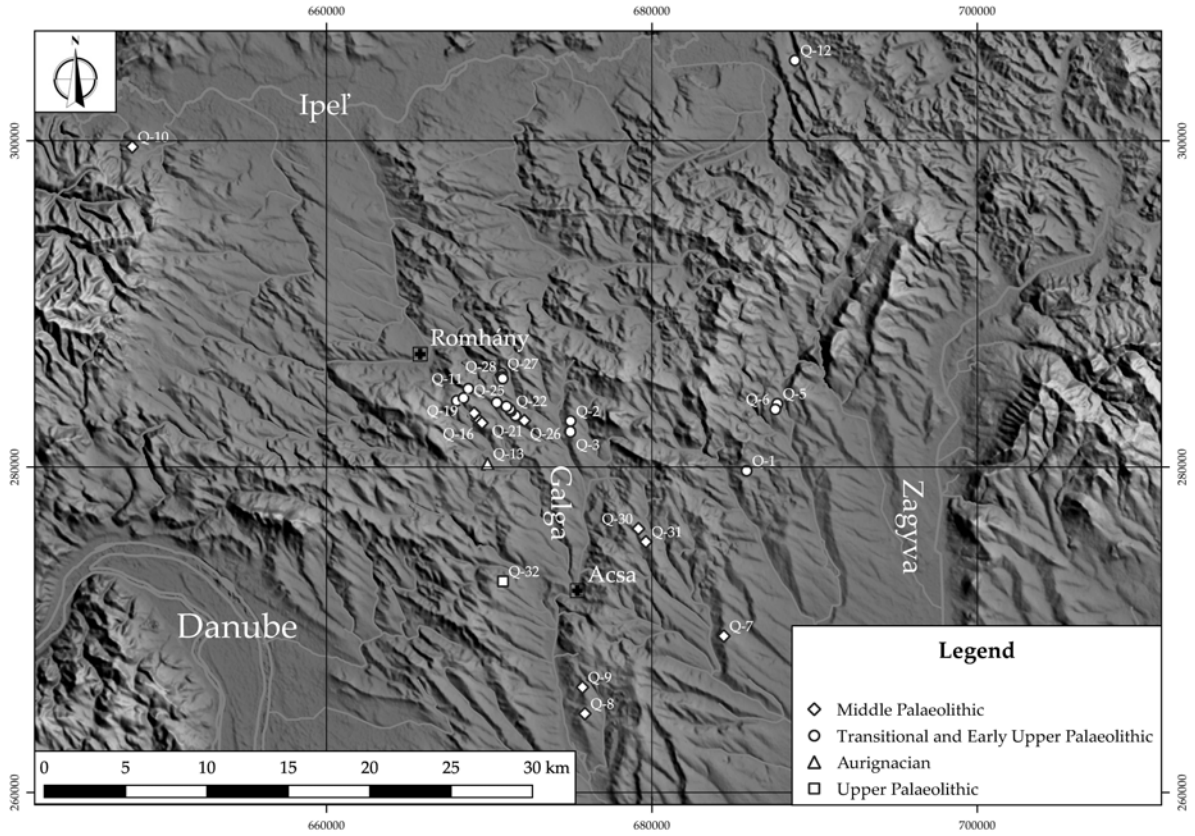

Fig. 1.: Archaeological sites with recorded quartzite utilization classified according to cultural affiliation in Nógrád County, especially the Cserhát Mountains.

Q1= Bér–Szár-hill 1 and 2, Q2=Bercel–Erdőben-vége 1, Q3=Bercel–Erdőben-vége 2, Q4=Bercel–Pinurka, Q5=Buják–Szente 2, Q6=Buják–Szente 2 (stray find), Q7=Erdőtarcsa–Daróci-hill, Q8=Galgagyörk–Csonkás-hill, Q9=Galgagyörk–Komárka, Q10=Hont–Csitár, Q11=Kétbodony–Halyagos-hill, Q12=Kisgéc–Fehér-hill, Q13=Legénd–Hosszú-lands, Q14=Legénd–Káldy-farm 2, Q15=Legénd–Káldy-farm 3, Q16=Legénd–Káldy- farm 5, Q17=Legénd–Káldy- farm 6 (stray find), Q18=Legénd–Rovnya 1, Q19=Legénd–Rovnya 2, Q20=Szanda–Patkányos-prairie, Q21=Szécsénke–Berecz-side 1, Q22=Szécsénke– Berecz- side 2E, Q23=Szécsénke– Berecz- side 2W, Q24=Szécsénke– Berecz- side 3, Q25=Szécsénke– Berecz- side 4, Q26=Szécsénke–Kis-Ferenc-hill, Q27=Szécsénke–Visak 1, Q28=Szécsénke–Visak 2, Q29=Szécsénke–Visak 3, Q30=Vanyarc–Szlovácka-dolina, Q31=Vanyarc–Tovi, Q32=Csővár–Arany-hill.

1. ábra: Kvarcit felhasználás kulturális alapon osztályozott régészeti lelőhelyeken Nógrád megyében, különös tekintettel a Cserhát hegységre.

Q1= Bér–Szár-hegy 1 and 2, Q2=Bercel–Erdőben-vége 1, Q3=Bercel–Erdőben-vége 2, Q4=Bercel–Pinurka, Q5=Buják–Szente 2, Q6=Buják–Szente 2 (stray find), Q7=Erdőtarcsa–Daróci-hegy, Q8=Galgagyörk–Csonkás-hegy, Q9=Galgagyörk–Komárka, Q10=Hont–Csitár, Q11=Kétbodony–Halyagos-hegy, Q12=Kisgéc–Fehér-hegy, Q13=Legénd–Hosszú-földek, Q14=Legénd–Káldy-tanya 2, Q15=Legénd–Káldy-farm 3, Q16=Legénd–Káldy-farm 5, Q17=Legénd–Káldy-farm 6 (stray find), Q18=Legénd–Rovnya 1, Q19=Legénd–Rovnya 2, Q20=Szanda–Patkányos-puszta, Q21=Szécsénke–Berecz-oldal 1, Q22=Szécsénke– Berecz-oldal 2E, Q23=Szécsénke– Berecz-oldal 2W, Q24=Szécsénke– Berecz-oldal 3, Q25=Szécsénke– Berecz-oldal 4, Q26=Szécsénke–Kis-Ferenc-hegy, Q27=Szécsénke–Visak 1, Q28=Szécsénke–Visak 2, Q29=Szécsénke–Visak 3, Q30=Vanyarc–Szlovácka-dolina, Q31=Vanyarc–Tovi, Q32=Csővár–Arany-hegy.

During the systematic field surveys, extraordinary attention was devoted to the occurrence of non-local raw materials as well. Among the 2,139 recorded artefacts, no quartzite artefact was present, siliceous pebble and nummulitic chert in low number were recorded. Since there are no known gravel beds in the surroundings of Nagyréde, both the siliceous pebbles (inclusive nummulitic chert) and the quartzite pebbles may have been originated from the bed of the Rédei–Nagy-streamlet.

From an archaeological point of view, the localization of a new site-complex at Nagyréde Közép-crag (**Fig. 3.**, Q-10) with Early Upper Palaeolithic characteristics can be regarded as an important by-product. The site-complex of about 600×400 metres extension is situated westward from the settlement of Nagyréde, near the settlement border to Ecséd. At the site-complex, the above-described documentation method was applied. Although, only as indicative for the utilization of these raw materials, quartzite and siliceous pebble artefacts are present. Beside a notched quartzite tool, there is a quartzite flake of large dimensions, which proves the application of the bipolar-on-anvil technique. There is also a flake core with several free-hand removals.

In 2017, in the area of Ecséd, about 6 kilometres to the west from Nagyréde, a new Palaeolithic site-

complex was localized and documented by the author (**Fig. 3.**, Q-5). M. Gutay (Dobó István Castle Museum, Eger) drew the attention of the author the possible existence of Palaeolithic sites in the area of Ecséd. Unfortunately, the results of her field surveys did not have been published yet. At four joined localities, containing 11 technically defined collection zones, the site-complex has an approximate extension of 33.85 hectares (0.3385 square kilometres). The collected lithic assemblages share the same technological and typological characteristics and can be regarded as (Early) Upper Palaeolithic. In the locality of Ecséd–Mogyorós- hill, among 629 recorded artefacts, there is a single quartzite fragment. At the locality of Ecséd–Gárdony, among 1,743 recorded artefacts, there are two quartzite tools (one side-scraper and one retouched flake) and one flake too. The quartzite pebbles, and the siliceous pebbles as well, may have been likely collected in the bed of the nearby Ágói- streamlet.

Quartzite as a raw material in Nógrád County and the Cserhát Mountains

Thanks to the intensive field surveys of the recent years', many quartzite artefacts (tools, cores and flakes) were found on the Palaeolithic sites belonging to different chronological horizons and cultural units, in such a great amount, which necessarily has to raise the attention to this raw material. The sites embrace the Late Middle Palaeolithic Micoquian-Bábonyian industry, the so-called "Vanyarc-type" industry, resembling the archaic Szeletian, the assumed Szeletian culture and based on the very recent field explorations the Upper Paleolithic Aurignacian and even the elder and younger phylum of the Gravettian entity.

Below some Palaeolithic sites will be reviewed very briefly. A detailed paper is in preparation on the subject of Palaeolithic raw material utilization of some non-flint raw materials in the Cserhát Mountains. Some of the most significant sites can be seen with an approximately chronological assignment on the map (**Fig. 1.**, Q-1–Q-32).

Micoquian-Bábonyian industry

In the archaeological materials of the Palaeolithic sites assigned to this industry mainly unworked quartzite flakes occur. This type of lithic raw material played a subordinate role in this industry. Á. Ringer in his dissertation on the Bábonyian wrote the following: „Im Abschlagsmaterial gab es noch Feuerstein, Quarzit und Kieselstein." (1983, 59). However, for comparison, in the Micoquian layers of the Kůlna cave in South Moravia among the used raw materials, there is a definite presence of quartzite, orthoquartzite rock crystal and smoky quartz (Valoch 1988; Neruda 2005). Both at Galgagyörk–Csonkás- hill (**Fig. 1.**, Q-8) and Galgagyörk–Komárka (**Fig. 1.**, Q-9), only one flake was found. At the Legénd–Káldy-farm site complex (**Fig. 1.**, Q-14, Q-15), four flakes and two chips of small dimensions might as well be related to tool production (Markó & Péntek 2003-2004,166, Table 1.). At the recently published material of the nearby Legénd-Káldy-farm 5 site (**Fig. 1.**, Q-16), there are eight flakes (1.71% of the entire assemblage containing 467 artefacts) (Péntek & Gábriel 2018). Next to the site, a side-scraper of great dimensions was found as a stray find.

In the area of Bercel, between the valleys of the Gólya streamlet and the Galga River, there is a comb of 300 to 800 metres variable width and with an asymmetric cross-section. The Palaeolithic site of Bercel–Erdőben-vége 1 is located along the western verge of the comb sloping steeply towards Galga Valley at a length of about 3.2 km (**Fig. 1.**, Q-2). The comb is covered with loess of variable thickness of the Upper Pleistocene age. The very low artefact intensity at the site depends on the thickness of the loess cover. From the lithic assemblage containing a small number of tools, two bifacial knives ("Keilmesser") made of limnic silicite of Mátra Mountains origin should be highlighted. The lithic raw materials include quartzite and siliceous pebbles from nearby gravel beds.

Beside a siliceous pebble flake core with an irregular hierarchy, there is a discoid quartzite flake core as well.

„Vanyarc-type" industry

In this paper dealing with the raw material utilization of the 1,949 artefacts stemming from the excavations of the Vanyarc–Szlovácka-dolina 5 Palaeolithic site (**Fig. 1.**, Q-30), the detailed raw material distribution is also given: the 14 quartzite artefacts have a percental ratio of 0.72% (Markó 2011a, 72). In his doctoral thesis, A. Markó evaluated the sites in the Szlovácka-dolina area of the settlement Vanyarc. At the same time, during this work he postulated this industry, resembling the archaic Szeletian industry. The processed material stems partly from excavations, partly from surface collections. Concerning the quartzite as raw material the author refers to its dominant role at some significant Hungarian Middle Palaeolithic sites, and thereafter states, that the occurrence of quartzite at the sites in the environment of Vanyarc can be regarded as sporadic. However, in the excavated material, the knapping on the spot can be illustrated by a refitting-group (Markó 2012, 27, 270). In the surface collections of the excavated site, several quartzite flakes and four convex side-scrapers were present (Markó 2007a, 12). At the nearby Vanyarc–Tovi site (**Fig. 1.**, Q-31) besides the flakes of different dimensions also a side-scraper was found.

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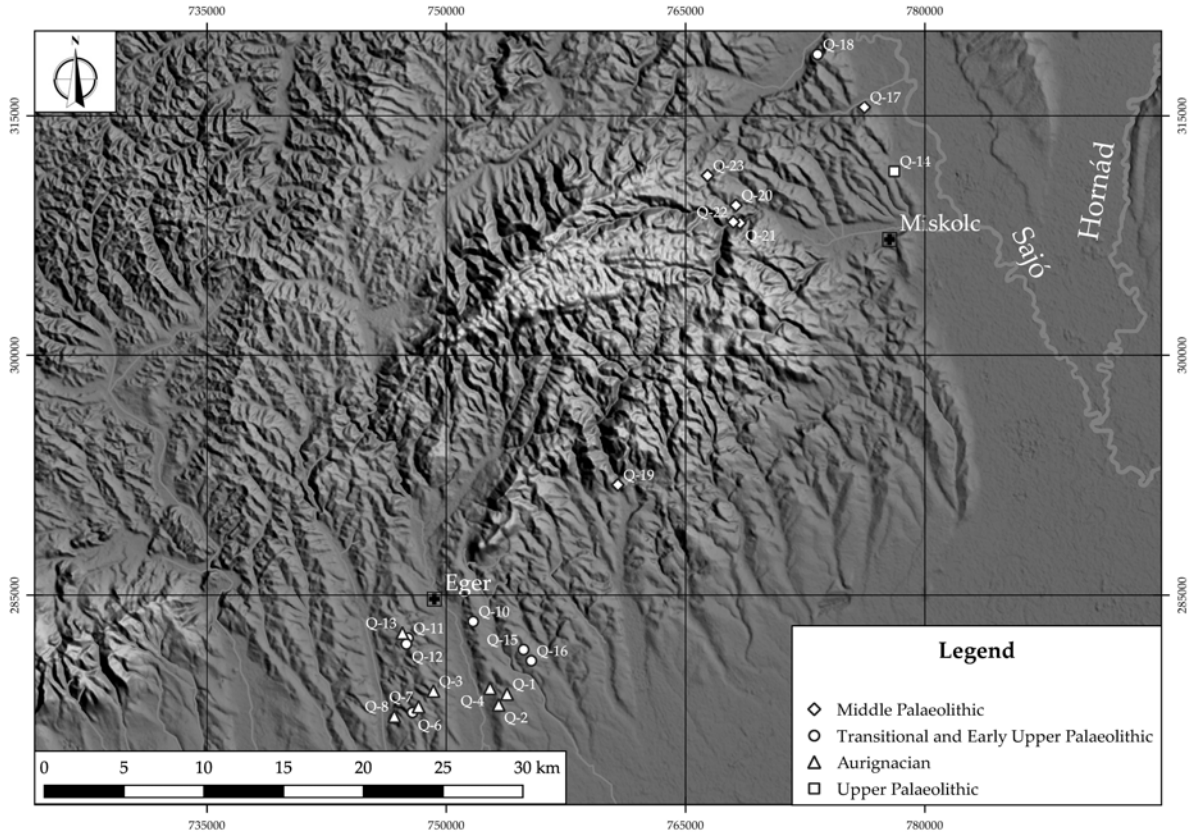

Fig. 2.: Archaeological sites with recorded quartzite utilization classified according to cultural affiliation in the surroundings of Miskolc (Sajó Valley) and Eger (southern foothills of the Bükk Mountains).

Q1=Andornaktálya–Gyilkos, Q2=Andornaktálya–Rózsa-hill, Q3=Andornaktálya–Szukszer-hill, Q4=Andornaktálya–Zúgó-lane, Q5=Csokvaomány–Határ-hilltop, Q6=Demjén–Hegyeskőbérc I-III, Q7=Demjén–Pünkösd-hill, Q8=Demjén–Szőlő-hill, Q9=Diósgyőr – Tapolca cave, Q10=Eger–Kőporos-hilltop, Q11=Eger–Kővágó-lane I, Q12=Eger–Kővágó-lane II, Q13=Egerszalók–Egerlátó-hilltop, Q14=Miskolc–Rózsás-hill, Q15=Ostoros–Rácpa I, Q16=Eger–Rácpa II, Q17=Sajóbábony–Méhésztető, Q18=Sajószentpéter–Margit-kapu-lane, Q19=Cserépfalu–Subalyuk cave, Q20=Miskolc–Büdöspest cave, Q21=Miskolc–Herman Ottó cave, Q22=Miskolc–Szeleta cave, Q23=Parasznya–Lambrecht Kálmán cave.

2. ábra: Kvarcit felhasználás kulturális alapon osztályozott régészeti lelőhelyeken Miskolc (Sajó völgy és Eger (Egri-Bükkalja) környékén.

Q1=Andornaktálya–Gyilkos, Q2=Andornaktálya–Rózsahegy, Q3=Andornaktálya–Szukszerdomb, Q4=Andornaktálya–Zúgó-dűlő, Q5=Csokvaomány–Határ-tető, Q6=Demjén–Hegyeskőbérc I-III, Q7=Demjén–Pünkösdhegy, Q8=Demjén–Szőlőhegy, Q9=Diósgyőr – Tapolca barlang, Q10=Eger–Kőporos-tető, Q11=Eger–Kővágó-dűlő I, Q12=Eger–Kővágó-dűlő II, Q13=Egerszalók–Egerlátó-tető, Q14=Miskolc–Rózsás-hegy, Q15=Ostoros–Rácpa I, Q16=Eger–Rácpa II, Q17=Sajóbábony–Méhésztető, Q18=Sajószentpéter–Margit-kapu-dűlő, Q19=Cserépfalu–Subalyuk barlang, Q20=Miskolc–Büdöspest barlang, Q21=Miskolc–Herman Ottó barlang, Q22=Miskolc–Szeleta barlang, Q23=Parasznya–Lambrecht Kálmán barlang.

"Szeletian" culture

The traces of quartzite utilization can be observed at several sites.

On the site of Hont-Csitár, in the Ipoly Valley, Northern Hungary (**Fig. 1.**, Q-10): M. Gábori performed an excavation in 1969. Unfortunately, there is no documentation available from this fieldwork, and the assemblage was not published by him. K. Zandler processed and published the mingled lithic material belonging to various Prehistoric horizons (Zandler 2010). There are three tools made of quartzite: a leaf-point, an end-scraper made on a flake collected as a stray find (Zandler 2010, 26), and a leaf-shaped side-scraper from trench IV (Zandler 2010, 32). There are several other quartzite chunks and hammer-stones. A certain part of the assemblage, the leaf-points and leaf-shaped side-scrapers, can likely be connected to the Szeletian industry.

From the recently published assemblage from Legénd–Rovnya 2 (**Fig. 1.**, Q-19) (Péntek & Zandler 2013b) containing 972 artefacts, 19 of them (1.95%), including seven flakes, 10 raw material chunks and two side-scrapers are made of quartzite. One of the tools is a simple side-scraper made on a massive, offset ("déjeté") flake with the dimensions of 65×46×19 mm and with a curved working edge. The curved left side-edge is bifacially worked

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(Péntek 2015, 61 Fig. 15, 1; Péntek 2019, Fig. 5, 3). The second one is also a simple, side-scraper made on a massive, offset ("déjeté") flake with a straight working edge ("racloir â dos naturel"). The curved left side-edge is unworked, forming a natural back. The right side-edge is rough-and-ready „denticulated". The platform exhibits an obtuse angle to the flaking surface (105-110°). Its dimensions are 64×46×22 mm (Péntek 2015, 61 Fig. 15, 2; Péntek 2019, Fig. 5, 4). The cultural classification of the site is not obvious, while beside the tools with definite Szeletian-like character, there are some Upper Palaeolithic (Aurignacian and possibly Gravettian) artefacts too.

In the lithic assemblage, containing 1,495 artefacts, from Buják–Szente 2 (**Fig. 1.**, Q-5): (Péntek & Zandler 2014), there is only a single quartzite artefact. The find is a rough-and-ready elaborated tool, a rather atypical side-scraper with a curved working edge. The blank of the tool was a pebble-slice of great dimensions, with the original pebble cortex as a natural back. With its dimensions of 66×53×26 mm, it is the greatest tool of the assemblage. From the deep loessy dirt road, leading to the site, another stray find came to light (**Fig. 1.**, Q-6). The find is a double side-scraper or a combined tool of great dimensions. Its retouched left side-edge is a curved convex side-scraper, on the distal end of the right side-edge, there is a slightly concave notch. Its dimensions are 53×42×16 mm. The tool can be likely related to the site. The place of the finding is a dominant strategical position, controlling the valley head of a „dead-end valley". It might have probably been a hunting station.

The site of Szécsénke–Kis-Ferenc-hill (**Fig. 1.**, Q-26) together with other localities and surface find concentrations localized on both sides of the Halyagos streamlet, are regarded as parts of a Szeletian site complex. The surface collected assemblage is characterized by significant quartzite utilization (Péntek & Zandler 2013a; Péntek 2015). The likely source of the quartzite pebbles is either the Szécsénke-Kis-Ferenc-hill site itself or the gravel bed which can be found in the area of the Szécsénke-Berecz-oldal-2W site (**Fig. 1.**, Q-23) 1 km to the northwest. The geological age of these gravel beds is Upper Oligocene „Chattian" stage (Noszky 1940, 43-47), in the recent Hungarian nomenclature it belongs either to the Lower Miocene "Budafok Sand Formation" (Hámor 1985, 234), or the Upper Oligocene „Pétervására Sandstone Formation" (Hámor 1985, 230; Korpás ed. 1988, 64-66). In the constitution of the gravel beds, the quartzite pebbles dominate. At the Szécsénke–Kis-Ferenc-hill site, there are 12 quartzite artefacts; its percental ratio in the assemblage, containing 1,218 artefacts is 0.94%. Besides nine flakes, there are also three notched tools.

On the Szécsénke–Berecz-oldal 1 site (**Fig. 1.**, Q-21), being part of the same Szeletian site complex, there is a unipolar quartzite flake-core with short flaking scars (Péntek 2015, 62 Fig. 17, 1). The back-side of the core is the natural breakage surface of the rock having the dimensions of 44×53×36 mm. On the Szécsénke-Berecz-oldal 3 site (**Fig. 1.**, Q-24), there are numerous flakes, mostly discoid cores (Péntek 2015, 63 Fig. 18), a notched tool with the dimensions 48×54×25 mm of quartzite, and a retouched microlithic tool made of vein quartz (21×18×8 mm). Finally, at the Szécsénke-Berecz-oldal 4 (**Fig. 1.**, Q-25) small find-concentration, there is a notched tool on a massive pebble-slice. Dimensions are 54×33×21 mm.

Early Upper Palaeolithic

In the area of Bercel, on the above-mentioned comb, in the south-west direction from the site Bercel–Erdőben-vége 1 (**Fig. 1.**, Q-2), there is another Palaeolithic site, Bercel–Erdőben-vége 2 (**Fig. 1.**, Q-3). The site is located also along the western verge of the comb sloping steeply towards Galga Valley, on a hilltop, at an altitude of 265 to 270 masl. The slope of the hill is steep in both the west and north-west direction. Most of the recorded artefacts were found on the slope in a secondary position. The flat hilltop has relatively uniform surface and low find intensity, because of the loessy cover. The local limnic silicite raw material dominates, but the presence of quartzite and siliceous pebble, likely from nearby gravel beds, is significant as well. Among the 109 recorded lithic finds, there are 15 siliceous pebble artefacts, and a proportionally great number of quartzite, 34 artefacts (8.31%). The quartzite artefacts include a large number of cores and core fragments and flakes. Based on the general morphology of the flakes, it is more than likely that on the site not only freehand knapping, but the bipolar-on-anvil technique was also applied. There are no retouched quartzite tools. Quartzite flakes may not have been converted into retouched tools since they were primarily required because of their sharp cutting edge. The bipolar technique is often used if the resulting flakes are to be utilized without further elaboration. However, any signs of use cannot be identified with the naked eye.

The lithic assemblage of the site does not contain any culture-specific tools. Based on the technological character of the pebble artefacts and some retouched and unretouched blades, it is quite likely that the lithic material belongs to the Early Upper Palaeolithic, having no Aurignacian relationship at all.

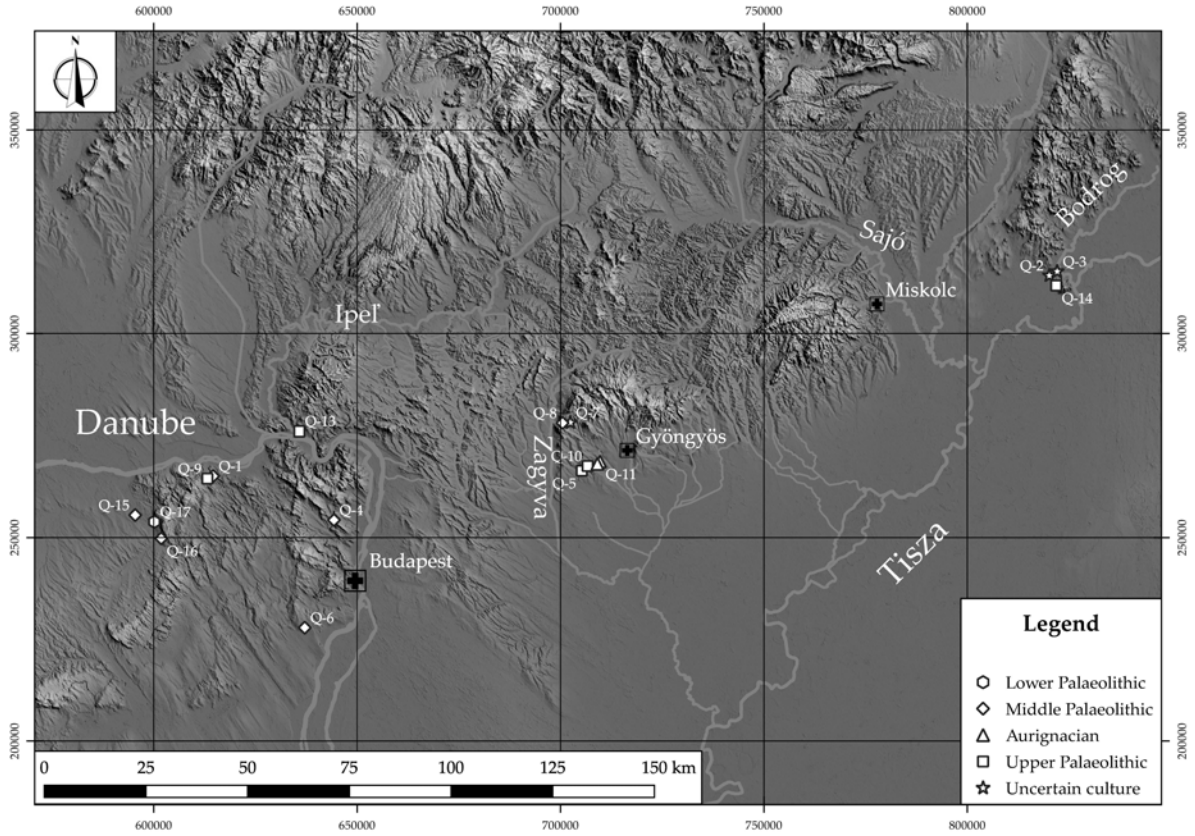

Fig. 3.: Diverse Hungarian archaeological sites with recorded quartzite utilization classified according to cultural affiliation.

Q1=Bajót–Jankovich cave, Q2=Bodrogkeresztúr–Dereszla (stray find), Q3=Bodrogkeresztúr–Kavicsbányadűlő- (stray find), Q4=Csobánka–Kiskevély cave, Q5=Ecséd–Gárdony, Q6=Érd–Fundoklia-valley, Q7=Gyöngyöspata 5 (Dobogó), Q8=Gyöngyöspata 53, Q9=Mogyorósbánya–Újfalusi-hills, Q10=Nagyréde–Közép-crag, Q11=Nagyréde–Öreg-hill, Q12=Nagyréde–Vájsz-lane, Q13=Szob–Ipolypart, Q14=Tarcal–Citrom-quarry, Q15=Tata–Porhanyó-quarry, Q16=Tatabánya–Szelim-cave, Q17=Vértesszőlős.

3. ábra: Kvarcit felhasználás kulturális alapon osztályozott magyarországi régészeti lelőhelyeken.

Q1=Bajót–Jankovich barlang, Q2=Bodrogkeresztúr–Dereszla (szórvány lelet), Q3=Bodrogkeresztúr–Kavicsbányadűlő- (szórvány lelet), Q4=Csobánka–Kiskevély barlang, Q5=Ecséd–Gárdony, Q6=Érd–Fundoklia-völgy, Q7=Gyöngyöspata 5 (Dobogó), Q8=Gyöngyöspata 53, Q9=Mogyorósbánya–Újfalusi-dombok, Q10=Nagyréde–Közép-bérc, Q11=Nagyréde–Öreg-hegy, Q12=Nagyréde–Vájsz-dűlő, Q13=Szob–Ipolypart, Q14=Tarcal–Citrom-bánya, Q15=Tata–Porhanyó-bánya, Q16=Tatabánya–Szelim-barlang, Q17=Vértesszőlős.

It is worth to mention that in the vicinity of the Bercel–Erdőben-vége 1 and 2 sites, there are at least three little lithic concentrations with quartzite artefacts (e.g. the site Pinurka, **Fig. 1.**, Q-4). The processing of the Palaeolithic sites and Palaeolithic stray find in the area of Bercel is in progress (Péntek, in prep. 2)

Upper Palaeolithic

In the assemblage of the site Erdőtarcsa-Daróci- hill (**Fig. 1.**, Q-7):, containing 601 artefacts, there are eight quartzite artefacts (1.33%), a blade, two flakes, and four quartzite chunks (Zandler 2008). The artefact mentioned as "hammer-stone", is a "retoucheur" of 94×40×22 mm, covered with a thick calcareous sinter layer. At one end of the stone, there are traces of beating, hammering activity. The assemblage also contains some Middle Palaeolithic tools with Micoquian-Bábonyian character. The edge of a bifacially worked tool, perhaps a leaf-point, is zigzaggy. During the elaboration, the WGK-concept ("wechselseitig gleichgerichtete Kantenbearbeitung", Bosinski 1967, 43) was applied (Zandler 2008, 60. and Fig. 3.:2). Moreover, according to the author, Upper Palaeolithic artefacts with decisively Aurignacian character can be found in the collection. However, in a typological point of view, the dihedral burins resemble alike to those of the Gravettian industry.

The lithic assemblages of four Palaeolithic sites in the area of Bér were published recently (Péntek & Zandler 2017). The "atelier" site Bér–Egresi-lane is located on a gravel bed with a large number of siliceous and quartzite pebbles, and limnic silicite chunks as well. Despite this fact, in the lithic assemblage of 403 artefacts, only the ratio of siliceous pebble and nummulitic chert is significant

(10.67%), the quartzite is represented only by two flakes. The tool-kit proves the mingled character of the site, besides side-scrapers, morphologically similar to Middle Palaeolithic Mousterian types, there are leaf-shaped tools, and Early Upper Palaeolithic and/or Aurignacian tool types too. The presence of quartzite is more pronounced at the sites of Bér–Szár- hill 1 and 2 (**Fig. 1.**, Q-1). Besides the waste-products, there are several cores, flakes and a massive, chunky denticulated tool of great dimensions (76×41×23 mm) (Péntek & Zandler 2017, 366 Fig. 11, 2).

Despite the presence of a bifacial tool and some side-scrapers, the recently published lithic assemblage of the site Legénd-Hosszú-lands (**Fig. 1.**, Q-13; Péntek 2018), has both technologically and typologically an Upper Palaeolithic character. The lithic assemblage contains 1,782 artefacts, among them 146 tools (8.19%). In the tool composition, the simple and multiple burins, first of all, the carinated types ("burin caréné" and "burin busqué") dominate over the end-scrapers. The typological character of the tools justifies the assigning of the assemblage to the Aurignacian industry. In the raw material utilization, the local limnic silicite dominates (62.4%), followed by siliceous pebble (inclusive nummulitic chert) (22.45%). The ratio of 92 quartzite artefacts is 5.16%. There is also a vein quartz fragment. There is only a single quartzite tool, a bifacial knife ("Keilmesser"); the other artefacts are mainly flakes of different sizes and shapeless pieces. It is necessary to make some remarks regarding the shapeless, amorphous quartzite artefacts. According to technological observations, not only freehand knapping, but the bipolar-on-anvil technique was also applied. In connection with the bipolar-on-anvil technique, W. Andrefsky Jr. wrote that the bipolar cores are generally amorphous and are easily interchangeable with angular fragments (Andrefsky 1998, 153). Despite the great resistance to thermic effects, caused by the rigidness of the quartz mineral, as a consequence of a sudden change of temperature, quartzite pebbles tend to burst, to fracture into blocky fragments and remain in place without scattering over distances (Petraglia et al. 2002, Section 11-6.). Among the tools, there is a bifacial knife ("Keilmesser") with a natural back („couteau â dos naturel"), made on a massive quartzite flake. Its straight right side-edge is unworked. The basis and the slightly curved left side-edge are partly covered by the original pebble cortex. The dimensions are 67×37×17 mm (Péntek 2018, 65 Fig. 10, 2). The site is located along a potential migration route, linking the numerous Gravettian/Epigravettian sites in the Galga Valley with the Epigravettian site Romhány–Diós-road in the Romhány Basin (Nógrád Basin). This fact could be a possible explanation for the presence of the fragment of a backed piece in the assemblage, which may even belong to the Gravettian entity. Fragments of backed pieces can be found in the above-mentioned assemblage of the nearby Legénd–Rovnya site (Péntek & Zandler 2013b).

The surface collected homogeneous assemblage of Csővár-Arany- hill 5 (**Fig. 1.**, Q-32) containing more than 1,300 artefacts, most likely belongs to the younger blade phylum of the Gravettian entity. In the assemblage, there are many quartzite flakes and a quartzite tool of great dimensions on a massive, atypical pebble-slice. The distal end of the left side-edge is bifacially worked. Its dimensions are 82×35×13 mm. Among the artefacts of the surface collection, there are several hammer-stones, suitable for flaking and some flat quartzite pebbles with surface scars. Due to these knapping stigmata, the latter can be interpreted even as anvils. This phenomenon corresponds to the fact that probably the most efficient method of the elaboration of quartzite pebbles is the so-called bipolar-on-anvil technique. The source of the quartzite pebbles is the near Upper Oligocene „Chattian" stage gravel bed, named "Mocsolyák", located at a distance of 350-400 m from the site as the crow flies.

Discussion

During field surveys between 2004 to 2006, M. Gutay (2007), localized and documented a large number of archaeological sites and small lithic concentrations in the area of the southern foothills of the Mátra Mountains. The spectrum of the collected lithic assemblages ranges from the Middle Palaeolithic to the Epipalaeolithic. All the same, among the lithic artefacts, there are only two quartzite artefacts. At the Early Upper Palaeolithic site-complexes of Ecséd–Gárdony, Ecséd–Mogyorós-hill and Nagyréde-Közép-crag, and the Aurignacian sites of Nagyréde 1 and 2, the presence of quartzite is infinitesimal. It should be noted, however, that the presence of siliceous pebble as a lithic raw material is also rare. Even though there is no available geological information on existing gravels in the region, pebbles can be collected practically in all streamlet beds. Taking into consideration the size of the collected assemblages, the reason for the subordinate role of the pebble raw materials cannot be research hiatus. By all means, for the time being, we should state only that the utilization of pebble raw materials can be considered as unremarkable in the area of the southern foothills of the Mátra Mountains.

Entirely different is the situation in Nógrád County, especially the Cserhát Mountains. There are altogether 32 archaeological sites and lithic concentrations, even some stray finds as well (listed in **Table 1**.), with the evidence of quartzite utilization.

Id	Settlement	Site name	Arch. Epoch	Assemblage size (pieces)	Quartzite artefacts (pieces)							EOV Y	EOV X	LAT	LON
					Tool	Flake	Shatter	Hammer-stone	Core	Total	Per cent (%)				
Q-1	Bér	Szár-hill 1 and 2	2	2 138	1	9	3	0	1	14	0,65	685817,00	279771,00	47,86066	19,52611
Q-2	Bercel	Erdőben-vége 1	2	40	0	0	0	0	1	1	2,50	674992,00	282789,00	47,88831	19,38162
Q-3	Bercel	Erdőben-vége 2	2	409	0	31	0	0	3	34	8,31	674984,98	282155,13	47,88261	19,38149
Q-4	Bercel	Pinurka	-1	3	1	2	0	0	0	3	100,00	675872,56	284717,17	47,90561	19,39350
Q-5	Buják	Szente 2	2	1 495	1	0	0	0	0	1	0,07	687702,47	283846,88	47,89721	19,55166
Q-6	Buják	Szente (stray find)	2	1	1	0	0	0	0	1	100,00	687580,40	283506,67	47,89416	19,54999
Q-7	Erdőtarcsa	Daróci-hill	1	601	0	3	4	1	0	8	1,33	684417,48	269622,93	47,76947	19,50661
Q-8	Galgagyörk	Komárka	1	169	0	1	0	0	0	1	0,59	675729,00	266473,00	47,74154	19,39051
Q-9	Galgagyörk	Csonkás-hill	1	964	0	1	0	0	0	1	0,10	675877,00	264846,00	47,72690	19,39239
Q-10	Hont	Csitár	1	1 581	3	15	14	3	0	35	2,21	648058,00	299633,00	48,04027	19,02140
Q-11	Kétbodony	Halyagos-hill	2	459	0	1	0	0	0	1	0,22	668713,00	284766,00	47,90630	19,29774
Q-12	Kisgéc	Fehér-hill	2	33	0	3	3	0	1	7	21,21	688781,00	304947,00	48,08690	19,56796
Q-13	Legénd	Hosszú-lands	3	1 782	1	39	50	0	2	92	5,16	669896,00	280210,00	47,86529	19,31336
Q-14	Legénd	Káldy-farm 2	1	238	0	1	0	0	0	1	0,42	669055,00	283093,00	47,89124	19,30224
Q-15	Legénd	Káldy-farm 3	1	149	0	3	0	0	0	3	2,01	669072,00	283281,00	47,89293	19,30248
Q-16	Legénd	Káldy-farm 5	1	467	0	8	0	0	0	8	1,71	669402,03	282803,23	47,88863	19,30687
Q-17	Legénd	Káldy-farm 6	1	3	1	0	0	0	0	1	33,33	669552,37	282676,90	47,88749	19,30888
Q-18	Legénd	Rovnya 1	2	8	0	1	0	0	0	1	12,50	668006,35	284033,10	47,89973	19,28826
Q-19	Legénd	Rovnya 2	2	972	2	7	10	0	0	19	1,95	668419,24	284197,87	47,90120	19,29379
Q-20	Szanda	Patkányos-prairie	-1	13	0	3	0	0	0	3	23,08	678073,95	283594,22	47,89542	19,42288
Q-21	Szécsénke	Berecz-side 1	2	122	0	3	3	0	0	6	4,92	671605,00	283128,00	47,89148	19,33634
Q-22	Szécsénke	Berecz-side 2E	2	161	1	1	2	0	0	4	2,48	671318,00	283406,00	47,89399	19,33252
Q-23	Szécsénke	Berecz-side 2W	2	262	0	5	4	0	0	9	3,44	671257,00	283526,00	47,89507	19,33171
Q-24	Szécsénke	Berecz-side 3	2	633	0	18	6	0	1	25	3,95	671057,00	283692,00	47,89657	19,32904
Q-25	Szécsénke	Berecz-side 4	2	27	2	3	0	0	0	5	18,52	670463,00	283916,00	47,89860	19,32111
Q-26	Szécsénke	Kis-Ferenc-hill	1	1 084	3	6	0	0	0	9	0,83	672162,56	282817,48	47,88867	19,34378
Q-27	Szécsénke	Visak 1	2	735	0	1	1	0	0	2	0,27	670776,00	285696,00	47,91460	19,32538
Q-28	Szécsénke	Visak 2	2	195	0	0	3	0	1	4	2,05	670782,00	285522,00	47,91304	19,32545
Q-29	Szécsénke	Visak 3	2	57	0	1	0	0	0	1	1,75	670824,00	285393,00	47,91187	19,32601
Q-30	Vanyarc	Szlovácka-dolina (surface collectic	1	1 600	4	15	3	0	0	22	1,38	679169,73	276210,99	47,82897	19,43704
Q-30	Vanyarc	Szlovácka-dolina (excavated assen	1	1 368	0	11	0	0	1	12	0,88	679169,73	276210,99	47,82897	19,43704
Q-31	Vanyarc	Tovi	1	557	5	30	1	0	3	39	7,00	679624,00	275409,00	47,82174	19,44305
Q-32	Csővár	Arany-hill 5	4	1 327	1	17	7	0	3	28	2,11	670845,00	272977,00	47,80021	19,32570

Table 1.: Archaeological sites in the Cserhát Mountains listed in the ascending alphabetical order of the settlement to which the site belongs administratively.

The enumeration of the attribute „Archaeological epoch" is the following: 1=Middle Palaeolithic, 2=Transitional and Early Upper Palaeolithic (sites with bifacial and leaf-shaped tools, inclusive leaf-points as well; Aurignacian tools are sometimes present), 3=Aurignacian, 4=Upper Palaeolithic/Late Upper Palaeolithic, -1=Uncertain cultural affiliation

1. táblázat: Régészeti lelőhelyek a Cserhát hegységben a települések növekvő sorrendjében.

Az „Archaeological epoch" (régészeti korszak) mező jelentése: 1=Középső Paleolitikum, 2=Középső Paleolitkum-Felső Paleolitikum átmeneti és korai Felső Paleolitikum (lelőhelyek bifaciális és levéleszközökkel, a levélhegyeket is beleértve; Aurignacien eszközök néha jelen vannak), 3=Aurignacien, 4=Felső Paleolitikum, Késő Felső Paleolitikum, -1=Bizonytalan kulturális besorolás.

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Id	Settlement	Site name	Arch. Epoch	Assemblage size (pieces)	Quartzite artefacts (pieces)							EOV Y	EOV X	LAT	LON
					Tool	Flake	Shatter	Hammer-stone	Core	Total	Per cent (%)				
Q-4	Bercel	Pinurka	-1	3	1	2	0	0	0	3	100,00	675872,56	284717,17	47,90561	19,39350
Q-20	Szanda	Patkányos-prairie	-1	13	0	3	0	0	0	3	23,08	678073,95	283594,22	47,89542	19,42288
Q-30	Vanyarc	Szlovácka-dolina (surface collection)	1	1 600	4	15	3	0	0	22	1,38	679169,73	276210,99	47,82897	19,43704
Q-10	Hont	Csitár	1	1 581	3	15	14	3	0	35	2,21	648058,00	299633,00	48,04027	19,02140
Q-30	Vanyarc	Szlovácka-dolina (excavated assemblage)	1	1 368	0	11	0	0	1	12	0,88	679169,73	276210,99	47,82897	19,43704
Q-26	Szécsénke	Kis-Ferenc-hill	1	1 084	3	6	0	0	0	9	0,83	672162,56	282817,48	47,88867	19,34378
Q-9	Galgagyörk	Csonkás-hill	1	964	0	1	0	0	0	1	0,10	675877,00	264846,00	47,72690	19,39239
Q-7	Erdőtarcsa	Daróci-hill	1	601	0	3	4	1	0	8	1,33	684417,48	269622,93	47,76947	19,50661
Q-31	Vanyarc	Tovi	1	557	5	30	1	0	3	39	7,00	679624,00	275409,00	47,82174	19,44305
Q-16	Legénd	Káldy-farm 5	1	467	0	8	0	0	0	8	1,71	669402,03	282803,23	47,88863	19,30687
Q-14	Legénd	Káldy-farm 2	1	238	0	1	0	0	0	1	0,42	669055,00	283093,00	47,89124	19,30224
Q-8	Galgagyörk	Komárka	1	169	0	1	0	0	0	1	0,59	675729,00	266473,00	47,74154	19,39051
Q-15	Legénd	Káldy-farm 3	1	149	0	3	0	0	0	3	2,01	669072,00	283281,00	47,89293	19,30248
Q-17	Legénd	Káldy-farm 6	1	3	1	0	0	0	0	1	33,33	669552,37	282676,90	47,88749	19,30888
Q-1	Bér	Szár-hill 1 and 2	2	2 138	1	9	3	0	1	14	0,65	685817,00	279771,00	47,86066	19,52611
Q-5	Buják	Szente 2	2	1 495	1	0	0	0	0	1	0,07	687702,47	283846,88	47,89721	19,55166
Q-19	Legénd	Rovnya 2	2	972	2	7	10	0	0	19	1,95	668419,24	284197,87	47,90120	19,29379
Q-27	Szécsénke	Visak 1	2	735	0	1	1	0	0	2	0,27	670776,00	285696,00	47,91460	19,32538
Q-24	Szécsénke	Berecz-side 3	2	633	0	18	6	0	1	25	3,95	671057,00	283692,00	47,89657	19,32904
Q-11	Kétbodony	Halyagos-hill	2	459	0	1	0	0	0	1	0,22	668713,00	284766,00	47,90630	19,29774
Q-3	Bercel	Erdőben-vége 2	2	409	0	31	0	0	3	34	8,31	674984,98	282155,13	47,88261	19,38149
Q-23	Szécsénke	Berecz-side 2W	2	262	0	5	4	0	0	9	3,44	671257,00	283526,00	47,89507	19,33171
Q-28	Szécsénke	Visak 2	2	195	0	0	3	0	1	4	2,05	670782,00	285522,00	47,91304	19,32545
Q-22	Szécsénke	Berecz-side 2E	2	161	1	1	2	0	0	4	2,48	671318,00	283406,00	47,89399	19,33252
Q-21	Szécsénke	Berecz-side 1	2	122	0	3	3	0	0	6	4,92	671605,00	283128,00	47,89148	19,33634
Q-29	Szécsénke	Visak 3	2	57	0	1	0	0	0	1	1,75	670824,00	285393,00	47,91187	19,32601
Q-2	Bercel	Erdőben-vége 1	2	40	0	0	0	0	1	1	2,50	674992,00	282789,00	47,88831	19,38162
Q-12	Kisgéc	Fehér-hill	2	33	0	3	3	0	1	7	21,21	688781,00	304947,00	48,08690	19,56796
Q-25	Szécsénke	Berecz-side 4	2	27	2	3	0	0	0	5	18,52	670463,00	283916,00	47,89860	19,32111
Q-18	Legénd	Rovnya 1	2	8	0	1	0	0	0	1	12,50	668006,35	284033,10	47,89973	19,28826
Q-6	Buják	Szente (stray find)	2	1	1	0	0	0	0	1	100,00	687580,40	283506,67	47,89416	19,54999
Q-13	Legénd	Hosszú-lands	3	1 782	1	39	50	0	2	92	5,16	669896,00	280210,00	47,86529	19,31336
Q-32	Csővár	Arany-hill 5	4	1 327	1	17	7	0	3	28	2,11	670845,00	272977,00	47,80021	19,32570

d **Table 2..** Archaeological sites in the Cserhát Mountains sorted ascending according to their cultural classification and the size of the lithic assemblage (in descending order).

The enumeration of the attribute „Archaeological epoch" is the following: 1=Middle Palaeolithic, 2=Transitional and Early Upper Palaeolithic (sites with bifacial and leaf-shaped tools, inclusive leaf-points as well; Aurignacian tools are sometimes present), 3=Aurignacian, 4=Upper Palaeolithic/Late Upper Palaeolithic, -1=Uncertain cultural affiliation.

2. táblázat: Régészeti lelőhelyek a Cserhát hegységben a kulturális besorolás növekvő sorrendjében.

Az „Archaeological epoch" (régészeti korszak) mező jelentése: 1=Középső Paleolitikum, 2=Középső Paleolitkum-Felső Paleolitikum átmeneti és korai Felső Paleolitikum (lelőhelyek bifaciális és levéleszközökkel, a levélhegyeket is beleértve; Aurignacien eszközök néha jelen vannak), 3=Aurignacien, 4=Felső Paleolitikum, Késő Felső Paleolitikum, -1=Bizonytalan kulturális besorolás.

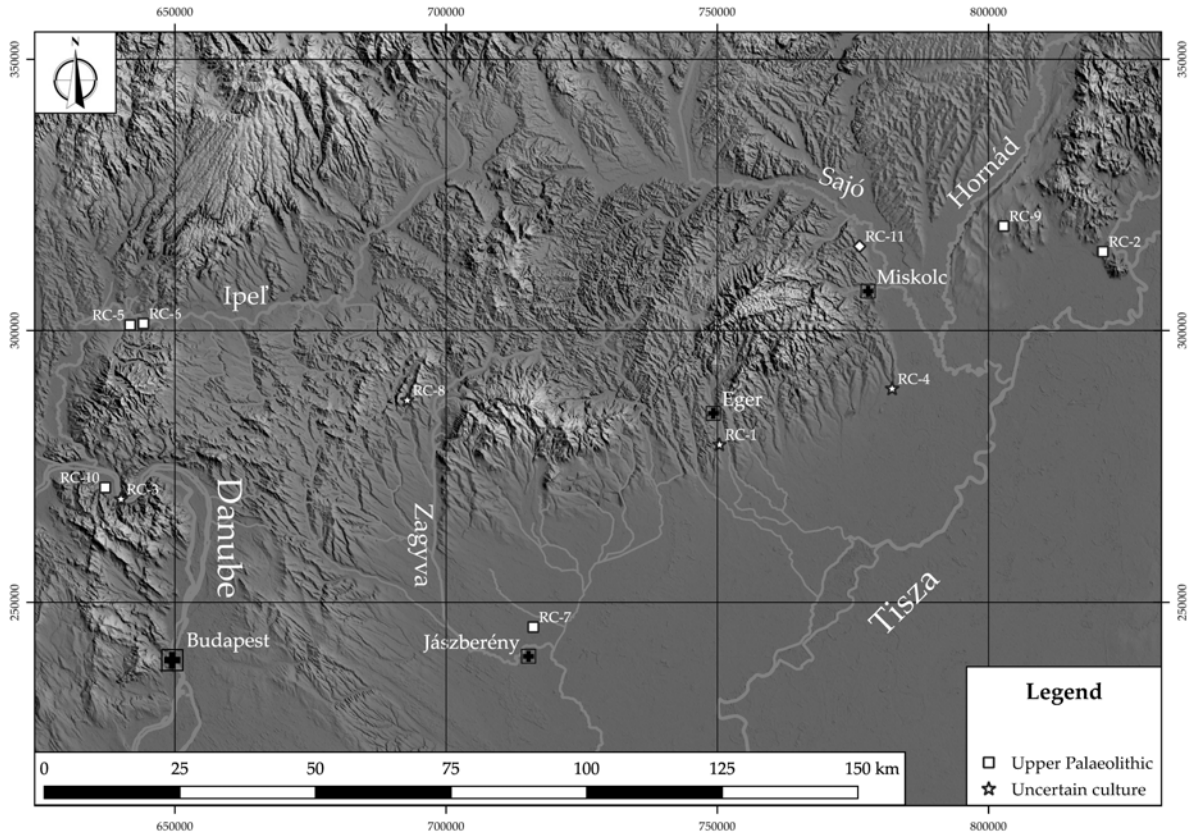

Fig. 4.: Hungarian archaeological sites with recorded rock crystal utilization classified according to cultural affiliation.

RC1=Andornaktálya-Alsó-hilltop, RC2=Bodrogkeresztúr-Henye, RC3=Dömös-Pattantyús, RC4=Emőd-Tehéntánc-lane, RC5=Hont-Ipoly-valley 1, RC6=Hont-Parassa III (Orgonás), RC7=Jászfelsőszentgyörgy-Székesdűlő, RC8=Kozárd-Fehér-side, RC9=Megyaszó-Szelestető, RC10=Pilismarót (Bánom, Bitóc, Pálrét, Tetves), RC11=Sajóbábony–Méhésztető.

4. ábra: Hegyi kristály felhasználás kulturális alapon osztályozott magyarországi régészeti lelőhelyeken.

RC1=Andornaktálya-Alsó-tető, RC2=Bodrogkeresztúr-Henye, RC3=Dömös-Pattantyús, RC4=Emőd-Tehéntánc-dűlő, RC5=Hont-Ipoly-völgy 1, RC6=Hont-Parassa III (Orgonás), RC7=Jászfelsőszentgyörgy-Székesdűlő, RC8=Kozárd-Fehér-oldal, RC9=Megyaszó-Szelestető, RC10=Pilismarót (Bánom, Bitóc, Pálrét, Tetves), RC11=Sajóbábony–Méhésztető.

The paper in preparation on some non-flint lithic raw materials contains a large number (107) of gravel beds as probable sources of pebble raw materials and archaeological sites (71) with recorded utilization of those non-flint raw materials (Péntek, in prep. 1). The reason for this abundance of evidence is firstly based on the fact that from a geological point of view this region of Northern Hungary is well researched (e.g. Noszky 1914, 1916, 1923, 1936, 1940; Peja 1937; Pávai-Vajna 1939-1940; Horusitzky 1942; Bogsch 1943; Szentes 1943; Láng 1967; Hámor 1985). Secondly, it is based likely on systematic field surveys.

In **Table 1,** the archaeological sites in the Cserhát Mountains are listed in the ascending alphabetical order of the settlement to which the site belongs administratively. The enumeration of the attribute „Archaeological epoch" is the following: 1=Middle Palaeolithic, 2=Transitional and Early Upper Palaeolithic (sites with bifacial and leaf-shaped tools, inclusive leaf-points as well; Aurignacian tools are sometimes present), 3=Aurignacian, 4=Upper Palaeolithic/Late Upper Palaeolithic, -1=Uncertain cultural affiliation. In **Table 2.**, the sites are sorted ascending according to their cultural classification and the size of the lithic assemblage (in descending order).

Concerning the 11 Middle Palaeolithic sites (at the site Vanyarc–Szlovácka-dolina, both the surface collection and the excavated assemblage contains quartzite artefacts), except for one site, the ratio of the quartzite artefacts in the assemblages is at most 2.21%. The exception is the site Vanyarc–Tovi (**Fig. 1.**, Q-31), where the ratio of quartzite is 7.00%, and among the 39 quartzite artefacts, there are five tools. Both from a technological and a typological point of view, the site belongs to the „Vanyarc-type" industry. That is why it is

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interesting enough that the eponymous site of the industry, at Vanyarc–Szlovácka-dolina the presence of quartzite is almost negligible.

Seventeen sites and lithic concentrations were classified as Transitional or Early Upper Palaeolithic. Among the sites with an assemblage size of some hundreds of artefacts, the highest quartzite ratio characterizes the Early Upper Palaeolithic site Bercel–Erdőben-vége 2 (**Fig. 1.**, Q-3; 8.31%). In the area of Szécsénke, almost all sites contain quartzite artefacts. At the four sites at the locality Szécsénke–Berecz-side (1, 2E, 2W, 3; **Fig. 1.**, Q-21–Q-24), the ratio of quartzite is between 2.48% and 4.92%. This ratio is somewhat higher than at the Middle Palaeolithic sites. Interestingly enough, at the sites Szécsénke–Visak (1, 2, 3; **Fig. 1.**, Q-27–Q-29), and Kétbodony–Halyagos-hill (**Fig. 1.**, Q-11), which have approximately the same technological and typological characteristics, the quartzite utilization is lower. If these sites belong to the same cultural entity or industry, these differences in quartzite utilization can be explained as stochastic, and the quartzite utilization (or in general, the utilization of pebble raw materials) in no way can be regarded as tradition. It is worth noting the two small lithic assemblages from the site Kisgéc–Fehér-hill (**Fig. 1.**, Q-12; 33 pcs.) and Szécsénke–Berecz-side 4 (**Fig. 1.** Q-25; 27 pcs.). The presence of quartzite is extraordinary high, 21.21% and 18.52% respectively. It should be emphasized the fact that the surface collections were not selective, as a general rule all artefacts were collected.

At the only Aurignacian site, the quartzite ratio is 5.16%. Comparing to other known Aurignacian assemblages in Hungary (e.g. the above-discussed Nagyréde 1 and 2 sites), it can be regarded as high.

And lastly, at the site Csővár–Arany-hill (**Fig. 1.**, Q-32), which has likely a Late Gravettian lithic assemblage, the ratio of quartzite utilization is 2.11%. Without having any comparison data, it cannot be evaluated. The evidence of the application of the bipolar technique is by all means remarkable.

To summarize very briefly, in the Cserhát Mountains during different Palaeolithic epochs, the quartzite utilization is well recorded. The quartzite - and in general the pebble raw material –utilization is always directly linked to nearby gravels. It is hardly expected that this fact would reflect only easy-going or opportunistic behaviour. At the same time, as it was mentioned above in connection with the Szécsénke–Berecz-side sites, the differences in the quartzite ratio (utilization index) are maybe random, and the quartzite utilization as such, cannot be regarded as a tradition.

It should be taken into consideration that in the Cserhát Mountains, most Palaeolithic sites are ephemeral sites, with very likely hunting functionality. If this is the case, sophisticated raw material procurement and utilization strategy are not to be expected.

The stone assemblages of the elder, classical sites with huge artefacts (Vértesszőlős (**Fig. 3.**, Q-17), Tata–Porhanyó-quarry (**Fig. 3.**, Q-15)) are partly unprocessed yet, so because of this understandable reason, the question of the quartzite artefacts could not come into view. It is true even for the large collection of the site Érd (**Fig. 3.**, Q-6), rich in artefacts, whereby only a small selected assemblage was processed. Nevertheless, in connection with this site, at least the fundamental technological analyses are forthcoming. These are essential to the analysis of any quartz or quartzite assemblage.

In the case of the Hungarian cave sites, because of the low number of the quartzite artefacts, this raw material was not given much importance. At the same time, in the cave site Diósgyőr–Tapolca cave (**Fig. 2.**, Q-9), the presence of some tools was not recognized among the artefacts. There is great uncertainty regarding the radiometric age, and excluding the site Érd, in the cultural affiliation of the quartzite artefacts. Unfortunately, the existence of the late Riss–Würm „quartzite horizon", rendered by V. Gábori Csánk as probable, can neither be proved nor disproved. According to Á. Ringer, similarities to the Taubachian industry came to light at the site Diósgyőr–Tapolca cave, also from the 2nd layer of the Szeleta cave (**Fig. 2.**, Q-22) and the 3rd layer of the Büdöspest cave (**Fig. 2.**, Q-20) as well as from the Lambrecht Kálmán cave (**Fig. 2.**, Q-23). In the first two cases with such accompanying artefacts, which typologically can be compared mostly to the „typical Mousterian" industry of the lower layer of the Suba-lyuk cave (Ringer 2001, 81). However, this statement is in contradiction with the supposed dating of the Taubachian to the Emiliani 5d stage. Based on the candidate dissertation and the paper, dealing with the revision of the cave sites in the Bükk Mountains, of Zs. Mester, the references to the layers of the Szeleta and Büdöspest caves are inaccurate. Regarding the occurrences of the quartzite artefacts the Szeleta 2/b. and Büdöspest 8. 9. layers („F" stratigraphic unit) these references should be accepted as correct (Mester 1994, 2001).

Regarding the Hungarian open-air sites, except for the late Palaeolithic sites Mogyorósbánya–Újfalusi-hills (**Fig. 3.**, Q-9), and Szob–Ipolypart (**Fig. 3.**, Q-13) only minimal quartzite occurrence is observed in the assemblages that came to light from excavations. It seems that quartzite utilization mainly occurred on sites belonging to the „Pebble Gravettian" or „Ságvárian" industry.

For the time being, we do not have sufficient surface collected lithic material from the open-air

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sites Csővár–Arany- hill 5 (**Fig. 1.**, Q-32) (probably Late Gravettian) in the Galga Valley and Legénd–Hosszú-lands (**Fig. 1.**, Q-13) (Aurignacian) in the Western Cserhát Mountains, to be able to make conclusions regarding this question.

During field surveys or surface collections in the environment of Eger and the Bükk Mountains, primarily quartzite tools, elaborated quartzite artefacts were collected. The occurrence of quartzite artefacts during the processing of the assemblages, stemming either from excavations or from surface collections, did not gain much importance. The quartzite artefacts, neither from typological nor from a technological point of view, got any distinctive attention. In the below-described assemblages, the spectrum of the tools made from quartz or quartzite is relatively small. In the case of the rock crystal (macrocrystalline quartz, **Fig. 4.**), besides some burins and borers, an end-scraper of small dimensions can be found. The flakes and blades are generally unworked. Among the quartzite tools choppers, chopping-tools, cleavers, rough-and-ready elaborated side-scrapers and/or knives, denticulated and simple, unretouched (Clactonian-type) notched tools dominate, sometimes resembling Lower Palaeolithic character. End-scrapers occur in fairly small number mainly on the Eger–Kőporos-hilltop site (**Fig. 2.**, Q-10). The presence of many unworked quartzite flakes occurring in the assemblages of several sites can be explained by the fact that due to their resistance, the quartzite flakes are well suited for several functions even without further elaboration.

We can only hope that the issue of the above-discussed raw materials will take up their place in the future raw material researches.

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