

Ground stone tools from the Late Neolithic site Hlebozavoda, Nova Zagora district

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ABSTRACT

The materials from the Late Neolithic site Hlebozavoda provide important information about the changes in the ground stone tool production as well as their use during the occupation of the site. The analyses of the raw materials, together with the study of production techniques, the artefacts' particularities and their stratigraphic position have strongly suggested that although ground stone tools production was taking place at the site, it was not an important part of its economy.

Two finds are of special interest: a fragment of quartz adze and a fragment of marble mace head. These two artefacts are not common in the Late Neolithic and most probably have a representative or symbolic character. The raw material of the mace head is most probably imported from the region around Topolovgrad and Elhovo, some 55 km to the southeast from the site.

Considering the data from the separate building horizons, a steady decline of ground stone tool production and use is observed. This situation may account for the restriction of the raw material supply area and the resulting use of limited rock types. On the basis of the accumulated data and observations about the separate occupation stages, we believe that this state of affairs is related to the slow decline of the settlement.

KEYWORDS

Late Neolithic economy, ground stone tools, Late Neolithic site Hlebozavoda, raw materials

Introduction

Concentrating on the archeological materials found during every new archaeological season, we often forget the finds which are already in the museums' store rooms, awaiting to be studied and published. In this paper, I would like to present the ground stone tool collection from a site, which was excavated a few decades ago and is one of the eponymous sites for the Late Neolithic period in South Bulgaria.

This article is written to mark the 50th anniversary of the first archeological season at the Late Neolithic site Hlebozavoda (district Nova Zagora). It aims to present the ground stone tools from the settlement and to give a general idea about their raw materials, dimensions, technology, production and stratigraphy, with the purpose to understand the changes that took place at this site throughout its occupation. The context of the finds will not be discussed here, because of the relatively limited information.

The study comprises of 35 unpublished artefacts representing the ground stone tools collection of the site. They are pre-forms, finished tools and tool fragments. A brief discussion of the hammer stones and the grinding stones from the site is offered to illustrate the main conclusions.

The geological examination of the materials was made macroscopically by the author with the support of Prof. F. Machev (Sofia University "St. Kliment Ohridski") and includes

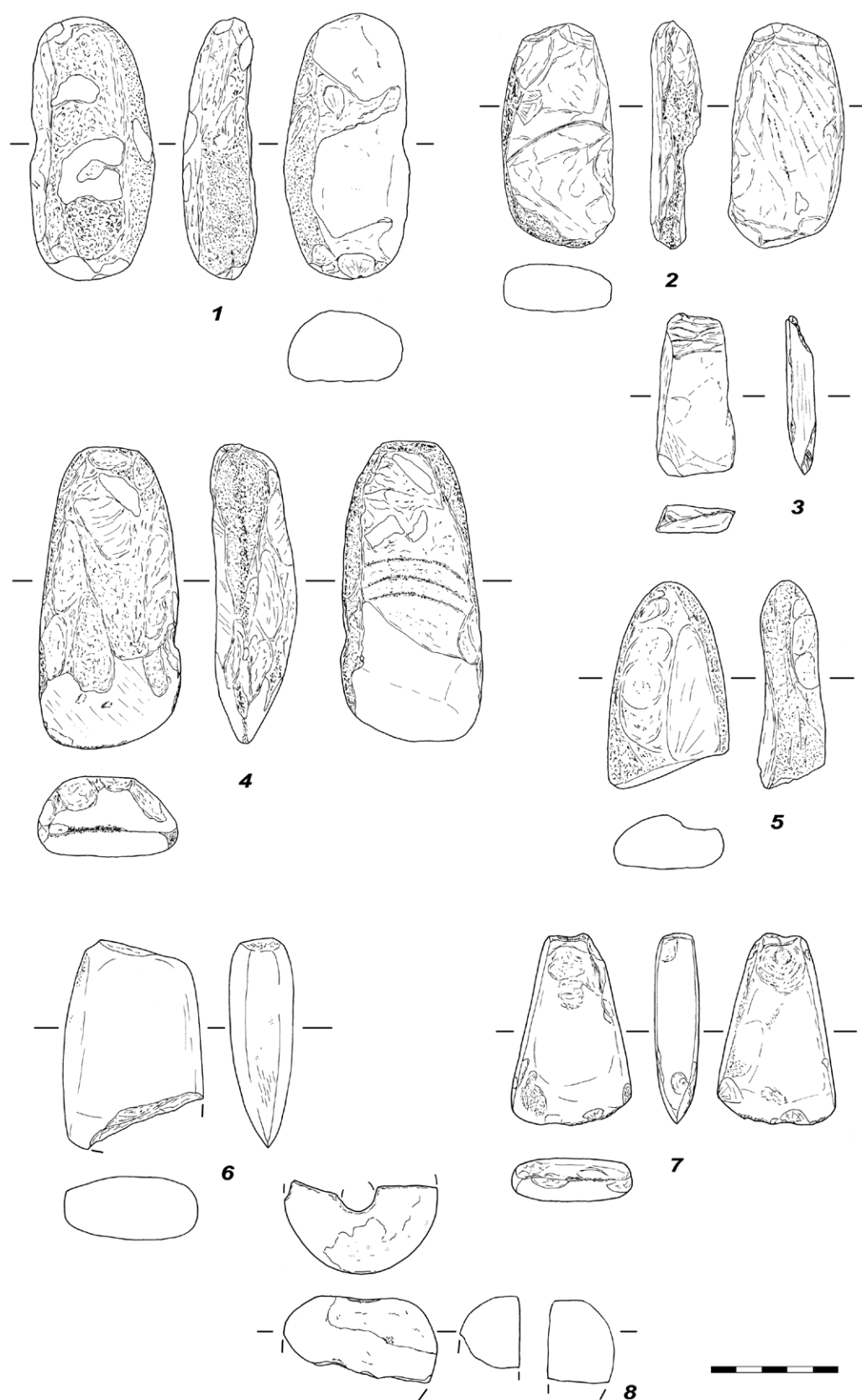


Fig. 1. Materials from building horizon III (drawings by I. Hadzhipetkov)
 Обр. 1. Материали от трети строителен хоризонт (рисунки И. Хаджипетков)

all of the studied materials. However, the raw material of six finds could not be determined due to the limestone crust covering their surface.

Geographical, geological and archaeological context of the site

The site is located in the northeast part of the Upper Thrace valley, in the west outskirts of the town of Nova Zagora. It is situated on a well-defined alluvial terrace, on the left bank of the river Chatalazmak.

The alluvial terrace is made of different sized boulders, pebbles, sand and clay. The geological history of the surrounding region is very diverse, and thus, there are rocks with different properties like andesite, volcanic tuff, sandstone, dolomite, metamorphosed granite, etc. (Цанков и др. 1992; 1995). The primary sources of those rocks can be found at more than 10 km from the site, in the hills of Sredna Gora Mountain and Sveti Iliyski Heights.

The archeological site was excavated, with some interruptions, in the period between 1968 and 1981 by M. Kanchev (Historical museum Nova Zagora). It can be described as open air site, with an approximate area of 5 hectares (КЪНЧЕВ 1976, 17). The culture layer is approximately 1.20 m thick and consists of three building horizons, numbered from up down (Kăncev, Kănceva-Ruseva 2002, 449).

The registered buildings are wattle and daub structures, with a diameter of the post holes between 0.10 and 0.30 m (КЪНЧЕВ 1976, 19-23, обр. 3-5 и 7). They are rectangular to slightly trapezoidal in plan (КЪНЧЕВ 1976, 17), organized in groups, orientated in cardinal directions and separated by passages and streets (Kăncev, Kănceva-Ruseva 2002, 449).

The archeological materials can be dated to the Late Neolithic – phase Karanovo IV-Kaloyanovets (КЪНЧЕВ 1976, 17).

Raw materials and production techniques

The group of the ground stone tools includes whole and fragmented axes, adzes, pre-forms, and two fragments of perforated ground stone tools (Table 1).

The majority of the finds is made from volcanic rock, in particular, andesite. The other rock types are sandstone, volcanic tuff, limestone, syenite, quartz and marble. The sources of these raw materials cannot be localized precisely at this stage due to the lack of geoarcheological investigation in this area. However, thanks to the geological characteristics of the region (Цанков и др. 1992; 1995) it is plausible that they are situated in the vicinity of the site, probably not more than 30 km away. The only exception is a piece of marble, whose source is in the area around Topolovgrad and Elhovo – 55 km to the southeast from the site¹.

Traces on the surface of the artefacts suggest that the raw materials were extracted from secondary and primary sources. This hypothesis is based on the fact that in some cases the surface is eroded, while in others it is not. Therefore, we can assume that some of the rocks were extracted directly from their outcrops and others were collected from river banks, slopes or fields. However, not all artefacts can be referred to one of those rock and we should always have in mind, that the eroded surface could be removed in the processing time.

The registered manufacturing traces provide a good base for the reconstruction of the production stages. Generally, there are traces of three techniques on the surface of the artefacts – flaking, pecking and grinding.

¹ The position of the source was determinated with the help of Prof. F. Machev (Sofia University “St. Kliment Ohridski”, Faculty of Geology and Geography).

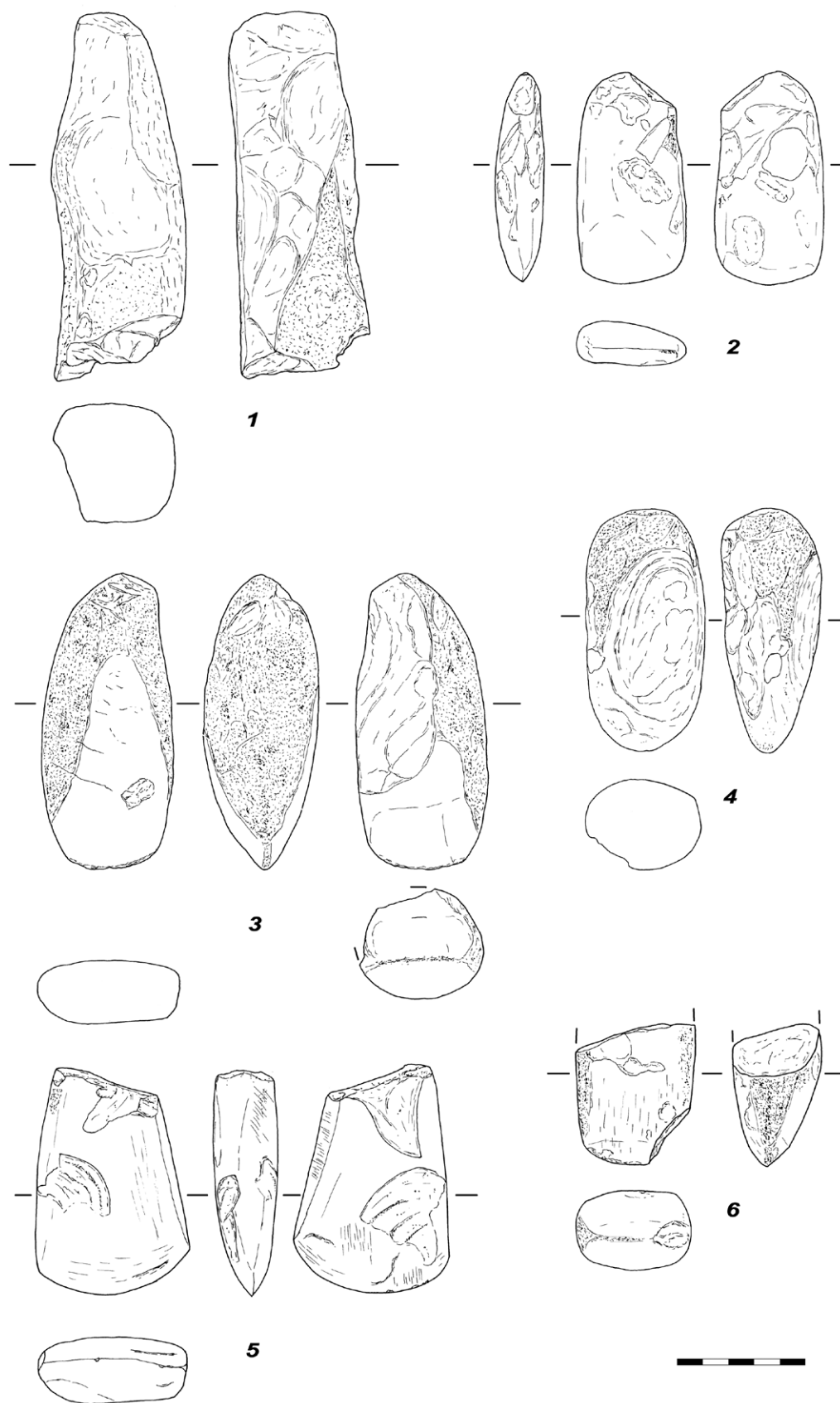


Fig. 2. Materials from building horizon II (drawings by I. Hadzhipetkov)
 Обр. 2. Материали от втори строителен хоризонт (рисунки И. Хаджипетков)

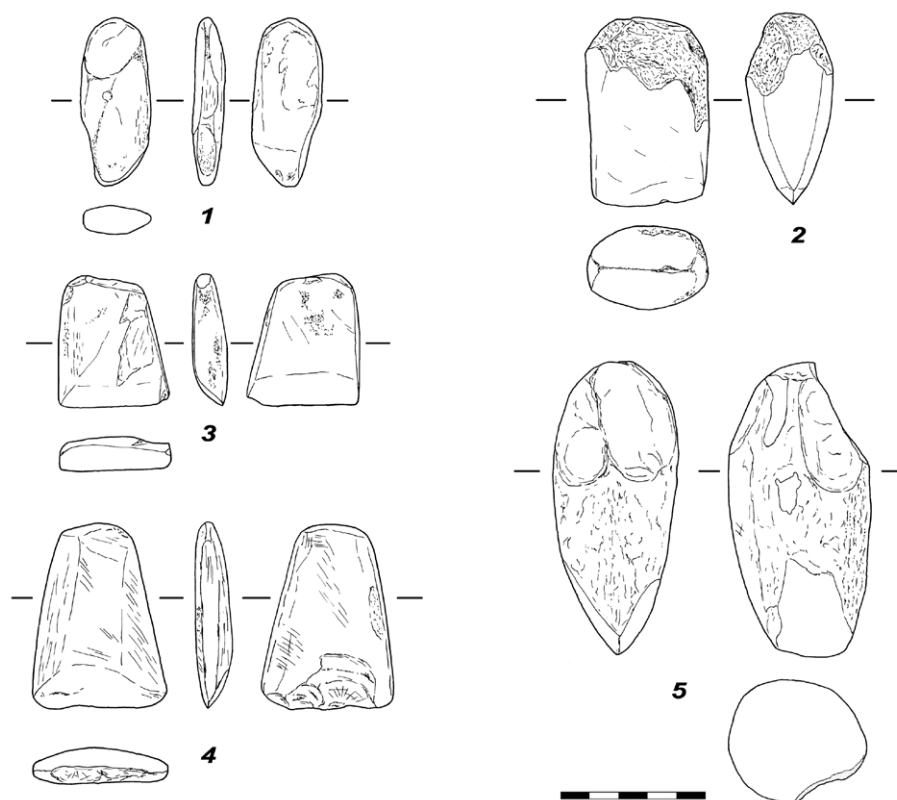


Fig. 3. Materials from building horizon I (drawings by I. Hadzhipetkov)

Обр. 3. Материали от първи строителен хоризонт (рисунки И. Хаджипетков)

Flaking is one of the basic technique in the stone processing but it is not very common among the materials from Hlebozavoda. This situation could be explained, on the one hand, by the frequent use of naturally shaped cobbles (figs. 1.1; 2.4; 6.1) where flaking is not necessary, and on the other hand by the relatively low number of preforms in a very early stage of production (figs. 1.3; 2.1; 3.1). However, some of the samples have traces of flaking related to the shaping of the proximal and lateral sides, as well as to the shaping of the working part, in order to create a sharp edge.

Pecking is another main production technique that is normally used to smooth the sharp angles left after the flaking or for more precise treatment of the surface. Traces of this technique are found frequently on the tools from the site, in some cases covering almost the entire body of the artefacts (figs. 1.4; 2.3; 3.5; 4.2; 6.6-7).

Grinding, although one of the main techniques in ground stone tool production, is generally rare in Hlebozavoda. However, there are artefacts whose surface is almost entirely even.

In some cases, the grinding is applied only on the working area leaving the rest of the object rough and uneven (figs. 1.4; 2.3; 3.5; 6.6-7). There are many possible reasons for this, but keeping in mind that the tools with rough surface are normally massive, this can be explained by their attachment to a handle, whereby the uneven surface ensures a better contact.

In terms of grinding, it is noteworthy that one of the most perfectly treated adzes is made of quartz (figs. 1.6; 6.3). This mineral is generally very difficult to process. It is hard to chop and its hardness is 7 on the Mohs scale. However, the example in our collection has a

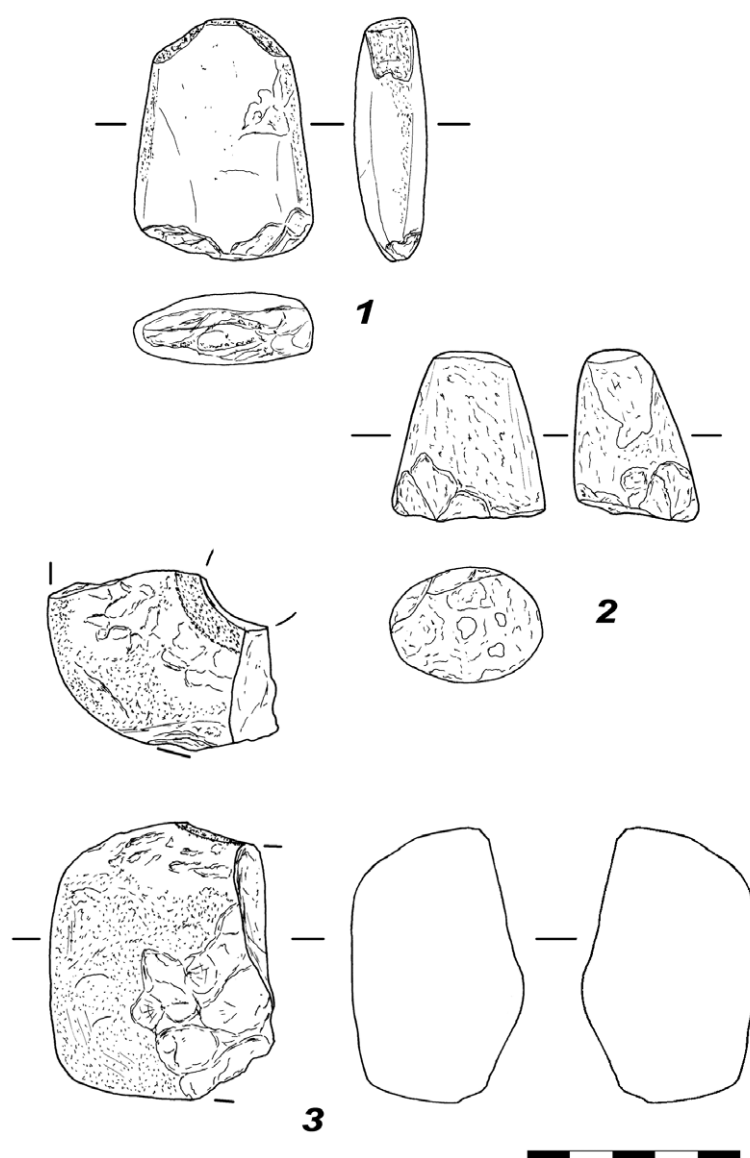


Fig. 4. Finds without stratigraphic data (drawings by I. Hadzhipetkov)

Обр. 4. Находки без ясна стратиграфска позиция (рисунки И. Хаджипетков)

perfectly even surface, with just a few traces of pecking and without any traces of flaking.

Some of the finds have traces of other techniques, such as thermal treatment and polishing or drilling. They are, however rare and are employed in specific cases, like the need to improve the properties of the raw material (Webb, Domanski 2009, 820), their use, the creation of special visual effects or a way to attach a handle.

Hammer stones and grinding stones

The hammer stones from Hlebozavoda are mainly made of andesite, sandstone and quartz. They have different dimensions and shape (fig. 5.1-7), thus, facilitating their use not only for food processing but also for treatment of harder materials like minerals, stones or bones.

An interesting part of this collection is the relatively common hammer stones with traces of use as an anvil on their dorsal or ventral side (fig. 5.6) and a hammer stone with grooves on its lateral side (fig. 5.7). The latter can be more correctly described as a hammer

because of the possibility to be attached to a handle. Tools like this are not unique in the area, but comparatively rare. They enable more powerful and accurate hits, than the hammer stones.

There are only a few grinding stones which is typical for sites in South Bulgaria. However, one of the grinding stones from Hlebozavoda is noteworthy. This grinding stone (fig. 5.8) is comparatively large and has two main types of traces.

This grinding stone tool was found in the third building horizon and it could be linked, although not directly, to the production of ground stone tools from this occupational stage.

Preforms and tools

Preforms. There are eleven registered preforms (figs. 1.1-3, 4; 2.1, 2, 4; 3.1; 4.1; 6.1-2). They are in different stages of production, which is strong evidence that the entire processing of the preforms was performed within the settlement. The finds are between 55 and 150 mm long, which corresponds to the length of the finished tools. The majority of the finds, however, are between 76 and 104 mm, which suggests that the ready tools were mainly middle to large in size.

Tools. There are 12 ground stone tools, entirely preserved or in a condition which is allowing their reconstruction (figs. 1.4, 6, 7; 2.2, 3, 5; 3.3-5; 6.3-7, 9). They are almost entirely adzes, with a length between 46 and 117 mm. The working angle of the tools varies between 69 and 93 degrees.

Some of the tools are carefully shaped (figs. 1.6; 3.4; 6.3) and are made from reshaped tool fragments (fig. 3.2), while others are relatively roughly shaped (figs. 1.4; 2.3; 3.5; 6-7). However, almost all of them have visible traces of use, thus suggesting that they were used in various practices.

There are 12 fragmented tools (figs. 2.6; 4.2). Most of them are upper parts with proximal ends. Their length varies between 39 and 69 mm, therefore it is safe to assume that their dimensions were similar to those of the complete tools.

Perforated stone tools. This group is represented by two fragments (figs. 1.8; 4.3; 6.8). One of them (fig. 4.3), despite its poor preservation, could be identified as an Early Bronze Age stone axe of the type A 1, according to M. Nikolov's typology (Николов 2011, 8) and it will not be discussed any further².

The second tool is a mace head (figs. 1.8; 6.8). This type of tool is also characteristic for the Early Bronze Age, but it is known from Early Neolithic contexts as well (Warren et al. 1968, 240; Mould et al. 2000, 137; Starnini, Szakmány 1998, 283; Лещаков и др. 2011, 52, обр. 3; Hadzhipetkov 2014, 362). In this study, the tool is considered to be Neolithic not only on the basis of the existing parallels, but also due to its secure stratigraphic position situating it in the third building horizon.

The mace head is made of fine marble, probably extracted from the area around Topolovrag and Elhovo. The same source area was used for the production of another mace head found at Hadzhidimitrovo, at 40 km to the east of the site (Петрова и др. 2017, in press). Although the two tools have different cross-sections (oval and bi-conical), they are similar in terms of dimensions, surface treatment and drilling technique. All this suggests

² The tool is without clear stratigraphic position and is probably related to the adjacent Early Bronze Age tell of Nova Zagora.

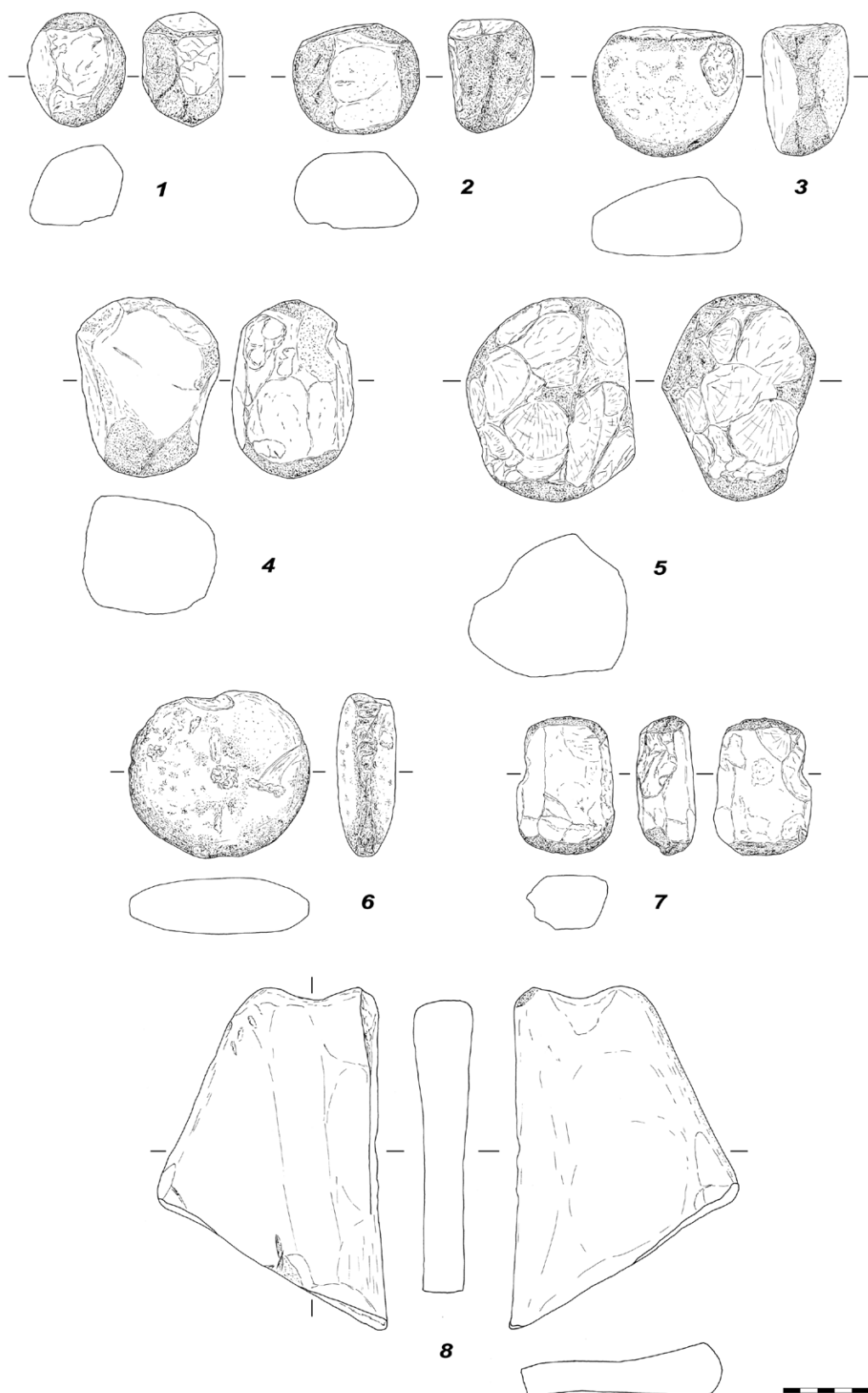


Fig. 5. Hammer stones, a hammer and a grinding stone from different building horizons
(drawings by I. Hadzhipetkov)

Обр. 5. Чукалки, чук и точило от различни строителни хоризонти
(рисунки И. Хаджипетков)

that the artefact from Hlebozavoda was most probably imported, very likely from the area of the middle Tundzha basin.

Stone tools from the different building horizons

Twenty-nine of the discussed artefacts have data about their stratigraphic position. On this basis, it is possible to trace the changes that were taking place with the ground stone tools over time.

There are 13 artefacts from the third building horizon (figs. 1; 6.2-3, 6, 8). This period is characterized by greater raw material variety, than the other two. Almost half of the artefacts are made from andesite, but there are also finds of volcanic tuff, sandstone, marble and quartz. The traces of production are very visible. The ratio between preforms and finished tools is 1 to 0.71 in favour of the preforms.

The artefacts from the second building horizon of Hlebozavoda are less in number (figs. 2; 6.1, 4, 5, 7). There were only nine tools found, six of which are made of andesite, two of sandstone and one of syenite. The ratio between tools and preforms in this occupational stage is changing – 1 to 2 in favour of the tools.

There are just six artefacts from the first building horizon (fig. 3). Almost all of them are made of andesite. The ratio between preforms and finished tools here is 1 to 5 in favour of the tools. The only preform here is a relatively small pebble with limited traces of treatment (Fig. 3.1).

The size of the tools from the different horizons is not very revealing. There are small, medium and large artefacts in all stages, although the concentration of larger tools is higher in the second and third building horizon.

Interpretation of the data

The observations discussed so far are made from the perspective of the ground stone tools and should be viewed with caution as far as the overall settlement development is concerned.

Although the number of finds from the site is relatively small, we can clearly see the change in stone tool production in the different occupational stages. The higher concentration of preforms coincides with the beginning of the settlement. This can be related to the founding of the community and the necessity of stone tools for the processing of wood needed for the execution of the building projects. From what is known about the used building techniques we can assume that the construction of every building imposed the use of relatively large number of tools, namely in initial preparation of the terrain, logging, wood processing and replacement of broken tools.

An interesting feature for this period is also the greater rock variety which suggests diverse and large raw material supply area. This situation could be explained on the one hand by the “political” and economical potential of the newly founded community, and on the other hand by the likely participation of people from different parts of the region in the founding of this settlement. These people have not only brought their own tools with them, but also the knowledge about the location of raw material sources and the social networks facilitating access to these sources.

An evidence for the important role of the site in this early period is also the registered marble mace head and the quartz adze. Given their specifics, such as the lack of visible traces of use and the rare raw materials, it is plausible that they were most probably some



Fig 6. Stone tools from different building horizons (photo by I. Hadzhipetkov)

Обр. 6. Каменни сечива от различни строителни хоризонти (снимка И. Хаджипетков)

kind of status symbols, separating their owner/s from the rest of the community and giving them the representative insignia to serve in front of the members from other communities.

The second building horizon was occupied by an already developed community, where the need for stone tools has diminished. The use of such tools here would be most probably connected with construction of new buildings, changes in their plan or with some renovations. This would respectively have led to a smaller in scale stone tool production which is indicated by the low number of preforms.

The rock type variation here is more limited in comparison with the previous horizon. This means that the settlement has decreased its raw material supply area. This could be explained on the one hand by the preference of some sources with proven qualities upon others, and on the other hand by the probable decrease of the influence and the contacts of the community.

The data from the first horizon suggests a situation, where the end of the site might be linked to the full decline of stone tool production and the limited number of raw materials. This could be explained by the decreasing need of tools and the slow abandonment of the site.

Cat. No.	Artifact	Length	Width	Thickness	Perforation diameter	Working angle	Raw material	Contex	Illustration
1588	adze/chisel	103	49	45		98	andesite	I horizon	Fig. 3.5
27	adze	62	37	11		71	volcanic tuff	I horizon	Fig. 3.4
894	adze	46	35	12		87	andesite	I horizon	Fig. 3.3
510	adze	65	41	30		84	andesite	I horizon	Fig. 3.2
540	adze - fr.	53	49	18			not identify	I horizon	
21	preform	58	22	10			andesite	I horizon	Fig. 3.1
1806	axe - fr.	54	46	32		85	not identify	II horizon	Fig. 2.6
50	axe	66	42	30			andesite	II horizon	
1751	tool fragment	51	41	23			sandstone	II horizon	
1866	adze	82	42	19		88	andesite	II horizon	Fig. 2.2
137	adze	84	53	25		81	andesite	II horizon	Fig. 2.5; 6.4
972	adze	114	48	48		80	andesite	II horizon	Fig. 2.3; 6.7
915	preform	142	48	48			sandstone	II horizon	Fig. 2.1
615	preform	95	47	36			syenite	II horizon	Fig. 2.4; 6.1
785	preform	104	47	28			andesite	II horizon	Fig. 1.1
2124	preform	76	46	30			andesite	II horizon	
2247	adze	90	54	25		70	quartz	III horizon	Fig. 1.6; 6.3
2225	adze	48	30	12		100	volcanic tuff	III horizon	
2855	adze	73	36	19		81	andesite	III horizon	Fig. 1.7
2749	adze	117	53	31		50	sandstone	III horizon	Fig. 1.4; 6.6
2201	adze - fr.	52	22	19		83	andesite	III horizon	
2781	mace head - fr.	31	60	60	12		marble	III horizon	Fig. 1.8; 6.8
2291	preform	89	58	24			sandstone	III horizon	
1154	preform	80	43	23			andesite	III horizon	Fig. 1.5
2889	preform	84	49	28			andesite	III horizon	Fig. 6.9
2772	preform	88	45	119			andesite	III horizon	Fig. 1.2; 6.2
2786	preform	62	26	10			volcanic tuff	III horizon	Fig. 1.3
2782	preform	150	88	70			andesite	III horizon	
1767	tool fragment	50	54	35			not identify	no data	
548	tool fragment	54	48	25			andesite	no data	
1260	tool fragment	67	37	39			not identify	no data	
1812	tool fragment	46	26	26			not identify	no data	
1427	tool fragment	39	34	28			andesite	no data	Fig. 4.2
383	preform	55	38	16			sandstone	no data	Fig. 4.1
286	Perforated axe - fr.	54	36	63	27		not identify	no data	Fig. 4.3

Table 1. Characteristics of the stone tools from the site of Hlebozavoda (size in millimeters)

Таблица 1. Характеристики на каменни сечива от обект Хлебозавода (размери в милиметри)

Conclusion

The stone tools from the site of Hlebozavoda provide an important information about the organization of the raw material extraction and the stone tool production and use in the three occupational stages.

The raw materials are mainly local of primary or secondary origin. The manufactur-

ing techniques - flaking, pounding and grounding - are typical for the region. The only exception is the drilling, which is rare in this period. However, the only artefact that has traces of this technique is most probably imported, thus confirming that this technique was not practiced at the site.

The evidence for stone tool production is overall limited and leads to the conclusion that this activity was not an important part in the economic life of the site. However, the available data suggests that the production was orientated, more or less, to satisfy the needs of the community. This hypothesis is supported by the fact that the ratio between preforms and tools is declining with every subsequent building horizon, probably with the declined need of tools.

Due to the nature of the site and the character of the above evidence we can observe the changes of the ground stone tools production and use in one Late Neolithic community during a relatively short period of time. This is very helpful to appreciate the value of this often undervalued group of artefacts.

Acknowledgment

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Огладени каменни сечива от къснонеолитното селище Хлебозавода, община Нова Загора

Илия Хаджипетков

(резюме)

Статията разглежда огладените каменни сечива, открити при разкопките на къснонеолитното селище Хлебозавода, община Нова Загора. Целта на изследването е да се анализират използваните суровини и техните предполагаеми източници; техниките на обработка; особеностите на отделните образци и тяхната стратиграфска позиция. Въз основа на получената информация е направен опит за теоретичното възстановяване на производството на този тип артефакти през отделните периоди на обитаване на селището.

Огладените каменни сечива от обекта са 35 на брой (Таблица 1). Те са изготвени от местни суровини, чиито първични източници са били разположени по всяка вероятност в района на Средна гора и Светиилийските възвишения. Изключение прави фрагмент от мраморно сечиво, чийто източник най-вероятно е бил разположен в района около Тополовград и Елхово – приблизително 55 км югоизточно от обекта.

Основните използвани техники на обработка са ломене, оглаждане чрез удари и шлифване. Паралелно с тях, но значително по-рядко, се срещат и образци със следи от полиране, пробиване и термична обработка.

Основната част от обработката на материалите е извършена най-вероятно в границите на селището. Този факт се подкрепя от откритите точила и каменни чукалки с различни размери и следи от употреба (обр. 5).

Метричните характеристики на сечивата от обекта позволяват да ги определим като средно до средно-големи образци. Впечатление прави сравнително грубата повърхност на завършените сечива, обхващаща в някои случаи почти цялото тяло на находките (обр. 1.4, 2.3, 3.5 и 6.6-7).

Две от регистрираните сечива заслужават да бъдат специално споменати. Първото е идеално шлифована тесла, направена от млечен кварц (обр. 1.6; 6.3), а второто – фрагмент от мраморен боздуган (обр. 1.8; 6.8). Въз основа вида на техните суровини, обработка и особености, може да се допусне, че те са имали по-скоро представителни функции и са отразявали специалния статут на техния притежател.

Извършените, по отделните строителни хоризонти, наблюдения върху използваните суровини, концентрацията на находки и техните особености, позволяват да се предположи, че макар производството на огладени каменни сечива да е било застъпено в границите на обекта, то не е заемало важна роля в икономиката на селището. Получените данните показват ясно, че обработката и употребата на този вид артефакти е намалявала във времето като паралелно с това се наблюдава и ограничаване на суровинното разнообразие, и свиване на използваната суровинна зона. Така регистрираната ситуация може да бъде обяснена с постепенния упадък на общността, съчетан с ограничаване на нейните икономически възможности.