VILNIUS UNIVERSITY

GABRIELĖ GUDAITIENĖ

THE FIRST INHABITANTS IN THE WESTERN PART OF THE NERIS RIVER BASIN IN LITHUANIA

Doctoral dissertation
Humanitarian sciences, History (05 H)

Vilnius, 2018

Dissertation was written in 2013–2017, in Vilnius University

Supervisor – Assoc. Dr Aleksiejus Luchtanas (Vilnius University, humanitarian sciences, 05 H)

English text reviewed by F. Petroševičius

VILNIAUS UNIVERSITETAS

GABRIELĖ GUDAITIENĖ

LIETUVOS PANERIO BASEINO VAKARINĖS DALIES PIRMINIS APGYVENDINIMAS

Daktaro disertacija
Humanitariniai mokslai, Istorija 05 H

Vilnius, 2018 metai

Disertacija rengta 2013–2017 metais Vilniaus universitete

Mokslinis vadovas – Doc. dr. Aleksiejus Luchtanas (Vilniaus universitetas, humanitariniai mokslai, istorija – 05 H)

Anglų kalbą redagavo Feliksas Petroševičius

CONTENTS

1. INTRODUCTION

> *„Daug įvairių kitų senovės paminklų aptikau sraujosios Neries slėny, daug galima būtų kalbėti apie kiekvieną jų skyrium, bet šį kartą ėmiau tik įdomesnes „sėdybas“ ir tai gal toli gražu ne visas. Dar laukia ir mano paminėtos čia ir dar visai nežinomos „sėdybos“ senovės mylėtojo ir mokslininko, kuris atsidėjęs ištirtų jas...“*
>
> P. Tarasenka, 1924

> ('Many old stations I have discovered in the swift river Neris valley, and a lot could be said about each of them, but this time I have introduced only the most interesting ones, and their list is probably far from being complete. All the mentioned 'stations' and still undiscovered ones await for an antiquity lover and a scientist, who would thoroughly investigate them…'
>
> P. Tarasenka, 1924)

The discussion on the first peopling of the prehistoric environment is undoubtedly impossible without the water body system taken into account. The pioneers of the land and the net of rivers and lakes in the area are significantly related when talking about late/post-glacial Northern Europe region. After the deglaciation fifteen thousand years ago the landscape was basically shaped by the water flows of melting ice; the primary features of the land – river streams and their valleys – have formed and attracted the first fauna and human beings to settle down.

Therefore the basis of this doctoral thesis – the relation between the first inhabitants and the river basin – was deliberately chosen and was the main impetus to raise the questions and hypotheses related to the topic. Studies which cover similar research were common in European archaeology[1], yet every area

[1] Burdukiewicz, J. M., 1987, Late Palaeolithic Settlements in the Kopanica Valley / In: Late Glacial in Central Europe: Culture and Environment, p. 183–213.
Zagorska, I., 1996, Late Palaeolithic Finds in the Daugava River Valley / In: The Earliest Settlement of Scandinavia and its relationship with neighbouring areas (ed. Larsson, L.), Acta Archaeologica Lundensia, No. 24, Lund, p. 263–272.
Costamagno, S., 1999, Stratégies de Chasse et Fonction des Sites au Magdalénien dans le Sud de la France / doctoral thesis, Université de Bordeaux, 760 p.
Koltsov, L. V., Zhilin, M. G., 1999, Tanged point cultures in the upper Volga basin / In: Tanged points cultures in Europe (eds. Kozłowski, S. K., Gurba, J., Zaliznyak, L. L.), Vol. 13, Lublin, p. 346–360.
Копытин, В., 1999, Финалный палеолит и мезолит верхнего Поднепровья / In: Tanged points cultures in Europe (eds. Kozłowski, S. K., Gurba, J., Zaliznyak, L. L.), Vol. 13, Lublin, p. 256–266.
Siemaszko, J., 1999, Stone Age settlement in the Lega Valley microregion of north-east Poland / In: European Journal of Archaeology, No. 2 (3), p. 293–312.
Baales, M., Grimm, S., Jöris, O., 2001, Hunters of the 'Golden Mile': The late Allerød Federmessergruppen Site at Bad Breisig, Central Rhineland, Germany / In: Notae Praehistoricae, p. 67–72.

taken under consideration was a bit different and yielded a dissimilar archaeological data that could have been examined. The level of preservation and methods used to investigate a certain territory varies when northern or southern parts of Europe are analyzed, and even in the considerably small Baltic region significant differences among Lithuanian, Latvian and Estonian archaeological material can be noticed. The chronological period discussed in this study – Final Palaeolithic and Early Mesolithic – also differs from the first settling timing few hundred kilometres to the south or northwards: Southern Poland or Germany was inhabited much earlier, whilst Estonia or other areas in the north probably saw the first land pioneers a bit later, only in the beginning of Holocene. Even though some efforts were put to discover archaeological data in Lithuania that would pre-date Weichselian gliacier period[2], no finds were undoubtedly proven to be artefacts, and none of the considered ones were found in the territory discussed in this study. Therefore the earliest possible settling of the western part of the river Neris basin was related to Final Palaeolithic, a period after the retreat of the Weichselian glacier.

There were several reasons why particularly river Neris was chosen for the investigation:

1) Its basin was never examined as a geographic unit yielding a certain archaeological Final Palaeolithic–Early Mesolithic data. A lot of separate surveys and few archaeological excavations have been undertaken in this area of around 3000 km^2 until now, however, a summarizing study is still lacking. Some of the sites were very important in Lithuanian as well as North-Eastern European Late Palaeolithic archaeology and were included in the number of

Djindjian, F., 2009, Le concept de territoires pour les chasseur cueilleurs du paléolithique supérieur européen / In: Le concept de territoires dans le Paléolithique supérieur européen (Djindjian, F., Kozlowski, J., Bicho, N. (eds.)), BAR International Series, book 1938, Proceedings of the XV World Congress (Lisbon, 4-9 September, 2006), p. 3–26.
Küssner, M., 2010, The Late Upper Palaeolithic in the catchment area of the River Saale – facts and considerations (Die spate Altsteinzeit im Einzugsgebiet der Saale – Fakten und Überlegungen / In: Quartär, Vol. 57, p. 125–137.
Winkler, K., 2018, Ahrensburgien und Swiderien im mittleren Oderraum. Technologische und typologische Untersuchungen an Silexartefakten der Jüngeren Dryaszeit / Doctoral dissertation, Christian-Albrechts University, Kiel.

[2] Piličiauskas, G., Jurkėnas, D., Laurat, T., 2011, Neandertaliečiai Lietuvoje? Prielaidos, tyrimai ir perspektyvos / In: Lietuvos archeologija, Vilnius, Vol. 37, p. 9–24.
Šatavičius, E., 2012, Titnago kasimo ir apdirbino dirbtuvės prie Titno ežero / In: Archaeologia Lituana, Vol. 13, Vilnius, p. 66–83.
Girininkas, A., Rimkus, T., Slah, G., Daugnora, L., 2017, Liungbiu tipo dirbiniai Lietuvoje / In: Istorija, Vilnius, Vol. 105, No. 1, p. 4–23.

overwhelming studies[3], however, they were not examined in a relation to a specific landscape and a water body system. Moreover, no connections between closely situated sites have been analyzed.

2) The most famous sites situated along the river Neris banks – Skaruliai, Eiguliai, Drąseikiai and other – were discovered almost one hundred years ago, but have never been the focus of extensive investigation. This is due to the fact that only surface finds were collected and analyzed, with almost no excavations undertaken. Therefore, these collections were even sometimes considered as being non valuable for scientific research.

The excavations undertaken by the author of this study in Pabartoniai 1 site, very close to the archaeological objects mentioned above, were supposed to provide an opportunity to assess what may have been lost from the sites that are now destroyed. It was expected that this would also contribute to the discussion of whether different find spots and sites along the river Neris relate to different populations or the same community of people, and over what period of time the archaeological material accumulated. In this way the old find collections would be brought back to the scientific discussion.

3) The area of research was important due to the key discrepancy between the regions to the north and south of the river Neris. Directly to the south of the Neris, that runs east–west, the region is rich in good quality flint nodules[4], with the river forming an apparent border with the region to the north, where flint nodules are scarcer and of poorer quality. Prehistoric populations reliant on flint as a key resource, including people of the Final Palaeolithic and Early

[3] Taute, W., 1968, Die Stielspitzen-Gruppen im Nördlichen Mitteleuropa. Ein Beitrag zur Kenntnis der späten Altsteinzeit / In: Fundamenta, A-5, Böhlau, Verlag, Köln, Graz.
Римантене, Р., 1971, Палеолит и мезолит Литвы, Вильнюс.
Kozłowski, S. K., 1975, Cultural Differentiation of Europe from 10th to 5th Millennium B.C. (Zróżnicowanie kulturowe Europy w X-V tysiącleciach P.N.E.), Warsaw, 260 p.
Kozłowski, J. K., Kozłowski, S. K., 1977, Epoka kamienia na ziemiach Polskich, Warszawa, 387 p.
Kozłowski, S. K., 1980, Atlas of the Mesolithic in Europe (First Generation Maps), University of Warsaw, 212 p.
Борисковский, П. И., 1984, Археология СССР: Палеолит СССР, Москва, p. 264, Fig. 100.
Zaliznyak, L. L., 1995, The Swiderian reindeer-hunters of Eastern Europe, Beiträge zur Ur- und Frühgeschichte Mitteleuropas 5, 140 p.
Szymczak, K., 1999, Late Palaeolithic cultural units with tanged points in North Eastern Poland / In: Tanged points cultures in Europe (eds. Kozłowski, S. K., Gurba, J., Zaliznyak, L. L.), Vol. 13, Lublin, p. 93–101.
Butrimas, A., Ostrauskas, T., 1999, Tanged point cultures in Lithuania / In: Tanged points cultures in Europe (eds. Kozłowski, S. K., Gurba, J., Zaliznyak, L. L.), Vol. 13, Lublin, p. 267–271.
Šatavičius, E., 2005, Svidrų kultūra Lietuvoje / In: Lietuvos archeologija, Vol. 29, Vilnius, p. 133–170.
(and many other).

[4] Baltrūnas, V., Karmaza, B., Kulbickas, D., Ostrauskas, T., 2007, Egzotinė titnago bei titnago pakaitalų žaliava Lietuvos akmens ir žalvario amžiaus gyvenvietėse / In: Lietuvos archeologija, Vol. 31, Vilnius, p. 109–122.

Mesolithic, presumably made economic decisions regarding flint exploitation and mobility based on this disparity. This is evidenced by the frequency of Final Palaeolithic settlements to the south of the river Neris, but not beyond its northern limits[5].

4) until this study was initiated no radiocarbon dating has been carried out on the sites in the river Neris basin, therefore their chronology was based only on tool typology and stratigraphy[6]. The AMS ^{14}C dating data was gained from the lately investigated sites in Pabartoniai and Dūkšteliai in order to bring the latest and previously discovered material into discussion on the exact chronology of the territory settling.

In addition, few interdisciplinary methods were used in the research: analysis of the archaeobotany remains and geochemical content of the objects in the excavated sites. These were two additional, however, not the main methods which have broadened the understanding about the human activity in the sites of Pabartoniai and Dūkšteliai. Also a stereoscopic analysis of the old aerial photography was done and LiDAR data was analysed to reconstruct a prehistoric landscape in certain areas in the river Neris basin.

All these points mentioned above frame the novelty of the theses and at the same time continue the work that has been done until now. The main object of the theses – **reconstruction of the first settling of the western part of the river Neris basin in Lithuania** – looks to address the following issues:

- The transition from Late Palaeolithic to Early Mesolithic in Eastern–Central Lithuania;

[5] Girininkas, A., 2009, Lietuvos archeologija: Akmens amžius, Vilnius, Vol. 1, 328 p.
Rimantienė, R., 1984, Akmens amžius Lietuvoje, Vilnius, 342 p.
Šatavičius, E., 2001, Vėlyvojo paleolito kultūros ir jų likimas ankstyvajame mezolite / Doctoral dissertation, Vilnius University, Vilnius, 135 p.
Zagorska, I., 2012, The ancient reindeer hunters in Latvia, Riga, 206 p.

[6] Girininkas, A., 2009, Lietuvos archeologija: Akmens amžius, Vilnius, Vol. 1, 328 p.
Jablonskytė, R., 1941, Akmens amžiaus stovykla Skaruliuose (Jonavos vls., Kauno apskr.), Vytauto Didžiojo kultūros muziejaus metraštis, Vol. 1, Kaunas, p. 1–18.
Jablonskytė, R., 1956, Pirminė kultūra Lietuvoje (Ekspozicijos vadovas), Kauno Valst. M. K. Čiurlionio vardo dailės muziejaus leidinys, Kaunas, 52 p.
Jablonskytė, R., 1965, Radikių (Kauno raj.) akmens amžiaus stovyklos / In: Lietuvos TSR Mokslų akademijos darbai, Serija A, Vol. 1 (18), p. 33–45.
Ostrauskas, T., 2002, Kundos kultūros tyrinėjimų problematika / In: Lietuvos archeologija, Vol. 23, Vilnius, p. 93–106.
Ostrauskas, T., 2002, Mezolitinė Kudlajevkos kultūra Lietuvoje / In: Lietuvos archeologija, Vol. 23, Vilnius, p. 137–162.
Ostrauskas, T., 2002, Apie vėlyvojo paleolito periodizaciją Lietuvoje. E. Šatavičiaus koncepcijos kritika / In: Lietuvos archeologija, Vol. 23, Vilnius, p. 239–246.
Rimantienė, R., 1984, Akmens amžius Lietuvoje, Vilnius, 342 p.
Šatavičius, E., 1997, Vėlyvoji Svidrų kultūra / In: Kultūros paminklai, Vilnius, Vol. 4, p. 3–15.
Šatavičius, E., 2005, Svidrų kultūra Lietuvoje / In: Lietuvos archeologija, Vilnius, Vol. 29, p. 133–170.
Яблонските-Римантене, Р., 1959, Стоянки каменного века в Эйгуляй / In: Вопросы этнической истории народов Прибалтики, Москва, p. 11–31.

- Flint exploitation to the north of the river Neris and economic/mobility decisions in relation to the paucity of quality resource;
- The river Neris as one of the key factors in determining site selection for early inhabitants of the region;
- The chronology of Late Swiderian settlements in Lithuania.

It was assumed that the numbered questions might be answered after a precise examination of the available data. Therefore a following **sequence of investigation steps** was chosen:

- Analysis of the old archaeological material held in the museums, re-evaluation of the find typology and possible chronology determined on this basis. Comparison between previously given interpretations and newly formulated estimation;
- Excavation of the two sites in river Neris basin – Pabartoniai 1 and Dūkšteliai 1 – that are situated in comparably different landscapes. Comparison between the newly discovered archaeological material and the find assemblages from other sites from the area that are kept in the museums;
- The search for the connecting and dissociating features among the investigated sites in the area. Analysis of the unique and outstanding discoveries or finds. Discussion on the possibilities to date some sites on the basis of their similarity in flint inventory.
- Collection of samples from Pabartoniai 1 and Dūkšteliai 1 sites for various research: AMS ^{14}C dating, chemical and physical composition of the archaeological features ground, archaeobotany research. Discussion on the earliest ^{14}C dates obtained, the function of some archaeological features discovered, and possible use of identified floral species.
- Reconstruction of the river Neris basin prehistoric landscape and evaluation of the environmental changes in the area. Drawing of the possible campsites and settlements net in the territory and making further conclusions on the economic reasons or certain landscape features that possibly had an impact on choosing the living site in Final Palaeolithic and

Early Mesolithic. Discussion on flint resources exploitation and the width of the first inhabitant's site-catchment.

- Making of the final conclusion on the available data: discussing the chronology, reasoning and character of the primeval settling process in the western part of the river Neris basin. Also making the most possible presumptions on the least perceptible things as the first inhabitants' mobility, beliefs, organization, creativity, etc.

In the process of investigation in 2012–2017 some new perspectives arose and it became obvious that additional methods of research would broaden the results and would give more detailed view of the first settlers of the river Neris basin. After some further excavation in the future a refitting of the flint assemblage found in the Pabartoniai 1 site would be reasonable and would help to answer the technological flint tool making questions. Moreover, the flint exploitation problem might be solved after an investigation on the chemical composition of the flint finds in various sites and raw material found in Southern Lithuanian flint exploitation spots. However, some methods can not be applied even in the future, e.g. microscopic analysis of the organic material, as most of the sites are situated in the sandy soil where pollens and very tiny plant remains do not preserve well. Further excavations in some of the most important sites discovered in 20th century also can not be conducted as most of them are already fully or partly destroyed by urbanization process and building activities. Therefore there are still several ways to continue the investigation while this study encompasses the basic available data analysis.

I am very grateful to Assoc. Prof. Egidijus Šatavičius, my teacher of Stone Age archaeology, who has given me an opportunity to take part in the excavations in various sites in the river Neris basin and for all the lessons and consultations he has given to me in 2008–2017. I would also like to thank to my friends and colleagues who gave me support and encouraged me to write the thesis: Dr Frank Moseler, Dr Luc Moreau, Dr Mara-Julia Weber, Jesse Davies & Dr Rob Dinnis, Dr Daniel Groß, Dr Liisa Seppänen, Mindaugas Džiautas and

Dalia Ostrauskienė. A special thanks goes to the archaeologists who supervised me working on my topic and gave me a lot of useful advises: Hab. Dr Rimutė Rimantienė, Prof. Berit Valentin Eriksen, Dr Ilga Zagorska, Hab. Dr Michail Zhilin and, of course, my supervisor Assoc. Prof. Aleksiejus Luchtanas.

I am also thankful to all of my friends, students and volunteers who have taken part in my own excavations in Dūkšteliai and Pabartoniai for their patience and hard work. A special thanks goes to my colleagues from other disciplines – Dr Žilvinas Ežerinskis and Dr Justina Šapolaitė, Laura Gedminienė, Dr Wiebke Kirleis and Prof. Helmut Kroll, Dr John Meadows, Dr Dalia Kisielienė and Dr Giedrė Motuzaitė-Matuzevičiūtė Keen for their contribution, help and advises in the interdisciplinary part of my research. I am also grateful to my colleagues Dr Rokas Vengalis, Jadvyga Purvaneckienė and Asta Vasiliauskaitė, who have made the access to the archaeological data.

Lastly, I am especially grateful to my wonderful husband Giedrius for the understanding and the time he has given to me.

2. HISTORY OF RESEARCH

Until now the archaeological investigation of the Final Palaeolithic and Mesolithic sites in the western part of the river Neris basin was carried out in various ways, but the very start of the discoveries reaches the end of the 19th century. At that time, in 1899, a famous explorer Fyodor Pokrovsky (Ф. В. Покровский) published a Kaunas district archaeological map (Археологическая карта Ковенской губернии), where the latest known archaeological objects were represented[7]. Along the river Neris and it's tributary river Šventoji tens of sites were marked as Stone Age find spots. However, most of them were places where some stone axes and other finds dating to Late Neolithic–Early Iron Age were discovered. Flint artefacts were found only in few sites: a flint axe in Pagiriai (Погиры) and some flint points in Svėdasai (Кунигишки) and Deltuva (Константиново). Though, it seems that some of the artefacts called 'flint points' were misinterpreted because of the similarity to the silica rock material and were actually pieces of belemnites (*Belemnoidea*) – objects of palaeontology. Also an antler point from Voloshinsky collection was mentioned in F. Pokrovsky map, hence, unfortunately the place where it was found and the dating was not ever revealed[8].

In the 80s of 19th century, Tadas Daugirdas (Tadeusz Dowgird) have organized expeditions on boat in the river Neris with a purpose to discover new historical and archaeological objects. In his expedition diary newly discovered Stone Age sites in the river lower reaches – Radikiai and Pabartoniai – were mentioned[9]. In 1907 the artefacts collection, including the finds from Radikiai site, was given to the Kaunas town museum by the finder himself[10].

In the early 20s an attention to the archaeological sites along the river Neris was attracted by Petras Tarasenka, who has collected and published some information about the so called 'old stations' (*sėdybas* in Lithuanian) with 'flint

[7] Покровский, Ф. В., 1899, Археологическая карта Ковенской губернии, Вильно.

[8] The same, p. 112–113.

[9] Dowgird T. 1909. Dziennik badań archeologicznych od stycznia 1881 roku do 1 stycznia 1888 roku Tadeusza Dowgirda, Manuscript Department of Vilnius University, Archive 1, p. 397.

[10] Girininkas, A., 2009, Lietuvos archeologija: Akmens amžius, Vol. 1, Vilnius, p. 19.

creatures' (*titnaginiai padarai* in Lithuanian) known in the area[11]. In his study various Stone Age sites – Eiguliai, Plebaniškiai, Lapės, Jonava, Skaruliai, Saleninkai – were marked in a small drawn territory plan, but the explorer gave a note that these were the most interesting, yet not the only sites he has discovered. Also Radikiai, Rusiai and various other sites were visited by P. Tarasenka, who had collected flint and pottery assemblages at many of them (Map 2). However, it was and is still is unclear, where the collection was held afterwads. Presumably the biggest part of it should have been kept in the museum in Kaunas, where he was working during and after 2nd World War.

The correlation between the data published in F. Pokrovsky map and the information in P. Tarasenka study is noticeable: some stone axe finding places in Jonava and Eiguliai were mentioned in both sources, therefore it might be possible that P. Tarasenka used some already known information, and not all of the find places were actually discovered by him[12]. However, the researcher regarded the maps of F. Pokrovsky as not informative enough[13], therefore after some years he prepared his own list of archaeological objects and a map, in which they were illustrated[14] (Map 3).

At that time P. Tarasenka included all of the known sites along the river Neris lower reaches into the list of archaeological objects. Radikiai site was mentioned as a 'discovered recently'[15], although some information about it, as it was mentioned above, was already known for many years. The biggest part of the Stone Age sites in the river Neris valley were discovered up until the late 20s, whilst some more sites were added to the list in the following decades. Thus, it might be said that the basic information about the earliest archaeological objects in the western part of the river Neris basin was obtained and summarized almost one hundred years ago (Maps 2–4). However, parts of

[11] Tarasenka, P., 1922, Ieškojimai neries ir Šventosios santeklyje / In: Mūsų senovė, Vol. 1, book No. 4–5, Kaunas, p. 574–590.
Tarasenka, P., 1924, Panerio pirmykštės kultūros sėdybos (Nuo Kernavės iki Kauno) / In: Kultūra, Mėnesinis iliustruotas mokslo populiarus žurnalas su „Daigų" priedu, No. 7–8, Kaunas, p. 299–310.

[12] Tarasenka, P., 1924, Panerio pirmykštės kultūros sėdybos (Nuo Kernavės iki Kauno) / In: Kultūra, Mėnesinis iliustruotas mokslo populiarus žurnalas su „Daigų" priedu, No. 7–8, Kaunas, p. 300, 309.

[13] Tarasenka, P., 1925, Gimtoji senovė. Ieškojimas, pažinimas, apsaugojimas, Kaunas, p. 107.

[14] Tarasenka, P., 1928, Lietuvos archeologijos medžiaga. Materialien für litauische Archeologie, Kaunas.

[15] The same, p. 127, 157, 220, 234.

the river Neris valley (between Kaunas and Jonava, Kernavė and Vilnius) and some areas along the river Šventoji stood out as yielding no Stone Age artefacts, despite of some prehistoric sites discovered by T. Dowgird.

About the same time a Russian archaeologist prof. Aleksandr Spicyn (Александр Спицын) published some writings about Lithuanian antiquity. Probably based on the information which was already published by his colleague P. Tarasenka, he mentioned that 'there are a lot of flint artefacts found in the district of Kaunas town'. There was also a remarkable discovery included in his study – an axe made of bone from Kaunas surroundings. This artefact was kept in the local museum and the archaeologist expressed an opinion that it might be a tool, that belonged to the so called 'bone and antler culture'[16]. Yet it must be notet that due to a rather small amount of archaeological material known from various places in Lithuania, on the basis of comparison with archaeological data from other countries the earliest Stone Age remains in the territory were basically ascribed to Neolithic.

The next stage of the river Neris basin investigation was a deliberate visiting of the already known sites and searching for new archaeological objects. It was the early 20s when famous professor Konstantinas Jablonskis and his little daughter Rimutė Jablonskytė (Rimantienė), started to regularly go to survey. In few decades a big set of flint artefacts and other finds collected from the ground surface was saved privately. Also a documentation and diaries were prepared thoroughly to systemize the collected archaeological data. In the 1925 this collection was already well known among the explorers and scientists of that time, moreover, it was predicted to be of a great importance in the future research[17].

The archaeological work in river Neris basin made by K. Jablonskis was mentioned in public for the first time in 1938, when a famous archaeologist and professional scientist Jonas Puzinas, who had sometimes accompanied K. Jablonskis in the survey expeditions, published the overview of Lithuanian

[16] Спицын, А.,1925, Литовские древности / In: Tauta ir žodis, Vol. 3, Kaunas, p. 114–115.

[17] The same, p. 121.

prehistory investigations since 1918. In the study he mentioned at least five 'Mesolithic Swiderian' sites, discovered by K. Jablonskis and noted some flint assemblages from another three Swiderian sites which were kept in the museum. Some flint find drawings from Radikiai site were published too[18]. Back then the western part of the river Neris basin was assigned to Mesolithic Swiderian–Tardenoisian culture[19] (Map 5). Whilst one year earlier J. Puzinas presented this conclusion in an international conference in Riga. It was probably the first time when scientists from other countries got to know about the prehistoric sites in the river Neris lower reaches[20]. Also, by that time a conception of a pre-Neolithic dating of the first inhabitants' appearance in Lithuanian territory was accepted.

Notwithstanding the numerous Stone Age sites discovered along the river Neris until the early 40s, while writing a new publication J. Puzinas discerned only Radikiai and Stavidvaris as the most important and the earliest Palaeolithic–Mesolithic Swiderian sites in Lithuania[21]. He did not ever excavate any of the prehistoric sites in the area, yet in 1937 during a graveyard excavation he has found one yellowish retouched or utilized flint blade in Eiguliai[22]. Yet on the basis of the archaeological data known by that time and the comparative material from other countries (after studying archaeology in the University of Heidelberg) the archaeologist came to an assumption that the first people had probably reached Lithuanian territory by heading from south-west. However, it was thought that in Palaeolithic people did not reach further areas than southern part of Lithuania, meaning that the river Neris basin was inhabited a bit later, in Mesolithic.

In the meantime K. Jablonskis and his daughter R. Jablonskytė continued their investigation. In 1938–1949 they visited many villages along the Neris and Šventoji rivers. Thousands of artefacts (flint tools and debitage) supplemented

[18] Puzinas, J., 1938, Naujausių proistorinių tyrinėjimų duomenys (1918-1938 metų Lietuvos proistorinių tyrinėjimų apžvalga), Kaunas, p. 9, Fig. 1.

[19] The same, p. 10.

[20] Puzinas, J., 1938, Stand der archäologischen Forschungen in Litauen / In: Pirmā Baltijas vēsturnieku konference Rīgā, 16.–20. VIII. 1937, p. 64.

[21] Puzinas, J., 1940, Lietuvos proistorės bruožai / In: Naujoji mokykla. Kraštotyra, Vol. III, Kaunas, p. 103 and 106.

[22] Puzinas, J., 1937, Eigulių II km. kapinyno tyrinėjimų ataskaita, 1935, 1937, 1938 m. / Copy of the file No. 424, State Museum in Kaunas, Archive of the Lithuanian Institute of History, No. 1131, p. 20.

their private collection. At that time the flint assemblage was interpreted referring to the typology, patina color, the regularity of the find form and the insights about flint knapping technology. In the diaries of K. Jablonskis the artefacts from river Neris valley were ascribed either to Mesolithic, or Neolithic.

Back in the mid 20th century K. Jablonskis' private collection was carefully sorted by his daughter R. Rimantienė. Later it was given to the National Museum of Lithuania where it is kept until today. However, according to R. Rimantienė, one important source of information – a diary of 1937–1939 – was lost during the Second World War, when a Russian soldier jumped into K. Jablonskis house through the window and stole it. Nevertheless, it is possible to trace the accurate history of K. Jablonskis survey, as the find labels include information about the exact dates of expeditions. According to the data, in 1933–1947 the archaeologist visited Bartoniai, Eiguliai, Kaunas, Pabartoniai, Drąseikiai-Stavidvaris, Radikiai, Skaruliai, Samantonys, Varpiai, Mitkiškiai, Rusiai, Kopūstėliai, Būgėnai, Juozapavas, Saleninkai, Kernavė and Ardiškis sites, most of them for several times.

It was not until the 40s–50s, when some of the sites were investigated archaeologically. In 1943 the first excavations in Samantonys site were undertaken by P. Baleniūnas[23], who was working as a conservator in Vytautas the Great Museum of Culture. R. Jablonskytė has accompanied the expedition, and after some years she has also decided to investigate one of the most interesting sites discovered in the river Neris valley. In July of 1948 she made a survey in Eiguliai site. The discovered data was published[24] and the most representative artefacts were displayed in the museum as Mesolithic finds[25]. Later on these collections became a reference.

When an overwhelming study about the Lithuanian archaeology was prepared in 1961, R. Rimantienė's insights on the finds from Eiguliai, Drąseikiai

[23] Baleniūnas, P., 1943, Pranešimas iš komandiruotės 1943 m. liepos mėn. 7-19 d. / Samantonys / excavation report, Kaunas, 2 p.

[24] Яблонските-Римантене, Р., 1959, Стоянки каменного века в Эйгуляй / In: Вопросы этнической истории народов Прибалтики, Москва, 1959, p. 11–31.

[25] Jablonskytė-Rimantienė, R., 1956, Pirminė kultūra Lietuvoje (Ekspozicijos vadovas) / In: Kauno Valst. M. K. Čiurlionio vardo dailės muziejaus leidinys, Kaunas, p. 7.

and Skaruliai sites were included into the Stone Age period description[26]. However, no advanced conception of the first settling of the area of focus was represented.

After all the known data was reconsidered, R. Rimantienė has published a scientific study of Lithuanian Palaeolithic and Mesolithic, that became a basic work for many decades. Some sites known from the river Neris valley were finally related to the Late Palaeolithic, thus, the concept of the pre-Mesolithic dating of the first settling of this land was delineated. Late Palaeolithic and Early Mesolithic settling was described by distinguishing several archaeological groups/cultures[27] (Map 6):

1) Late Palaeolithic Peribaltic Magdalenian group (related to Ahrensburgian, Brommean and Lyngby cultures), an example of which was Vilnius 1 site (according to R. Rimantienė it could be related to Ahrensburgian type of sites);
2) Late Palaeolithic Swiderian group (related to Solutrean tradition and Mazovian cycle), the examples of which was Eiguliai 1, Skaruliai 1 sites (according to R. Rimantienė, they were related with an Early Swiderian stage, as points with not tightened tang were regarded as pre-dating the ones with tightened tang).
3) Early Mesolithic Epi-Palaeolithic culture, as a continuation of Late Palaeolithic cultures in a complex form: with all elements interchanged. Drąseikiai, Saleninkai 2 and 3 sites were given as examples of this culture, as they yielded a lot of different types of tools.

Soon after, thanks to the R. Rimantienė's correspondence with archaeologists from other countries and publications written in foreign languages, Skaruliai, Eiguliai, Drąseikiai sites became well known internatio-

[26] Kulikauskas P., Kulikauskienė R., Tautavičius A., 1961, Lietuvos archeologijos bruožai, Valstybinė politinės ir mokslinės literatūros leidykla, Vilnius, 561 p.

[27] Римантене, Р., 1962, Периодизация и топография поселений каменного и бронзового веков в Литве (По данным поселений центральной Литвы) / Автореферат диссертации на соискание ученой степени кандидата исторических наук, Вильнюс, 18 р., Archive of the Lithuanian Institute of History, file No. 461087.
Римантене, Р., 1971, Палеолит и мезолит Литвы, Вильнюс.

nally[28], were related to Palaeolithic Swiderian culture.

A bit later publishing of Atlas of Lithuanian SSR archaeology was initiated and short information about all the known Stone Age sites of that time became a part of its content[29]. The work was done by R. Rimantienė, who has collected all the written sources where the sites were mentioned and briefly described the finds found in each of them.

In the late 80s Kernavė village surroundings became an object of archaeologist's interest. Up until today at least three different Final Palaeolithic and Mesolithic sites were discovered there during survey expeditions and some parts of them were investigated, though an overwhelming study of lithic assemblage was never published[30]. By that time along with some other newly excavated sites in Lithuania, the place was thought to have been settled only in Neolithic.

In the late 90s and a bit later R. Rimantienė has revisited some sites in the river Neris basin to find out if they were still preserved and how wide their territory could be. Some surveys were organized, however, after the research it was stated that some sites were almost fully destroyed, whilst others were not relocated. Meanwhile an overwhelming study of Lithuanian Stone Age

[28] Taute, W., 1968, Die Stielspitzen-Gruppen im Nördlichen Mitteleuropa. Ein Beitrag zur Kenntnis der späten Altsteinzeit / Fundamenta, A-5, Böhlau, Verlag, Köln, Graz, p. 158, Fig. 158–159.
Яблонските-Римантене, Р., 1966, Периодизация мезолитических стоянок Литвы / In: У истоков древних культур (эпоха мезолита), Материалы и исследования по археологии СССР, Москва, Ленинград, p. 75–87.

[29] Rimantienė, R., 1974, Akmens amžiaus paminklai / In: Lietuvos TSR archeologijos atlasas. Akmens ir žalvario amžiaus paminklai, Vol. I, LTSR Mokslų akademijos istorijos institutas, Vilnius.

[30] Baltramiejūnaitė, D., Vengalis, R., 2010, Tyrinėjimai Semeniškėse / In: Archeologiniai tyrinėjimai Lietuvoje 2009 metais, Vilnius, p. 98–105.
Luchtanas, A., 1984, Gyvenvietės prie Kernavės tyrinėjimai 1983 m. / In: Archeologiniai tyrinėjimai Lietuvoje 1982-1983 metais, Vilnius, p. 28–31.
Luchtanas, A., 1986, Gyvenvietė Kernavėje Neries krante / In: Archeologiniai tyrinėjimai Lietuvoje 1984-1985 metais, Vilnius, p. 30–32.
Luchtanas, A., Merkytė, I., Abaravičius, G., 1989, Žvalgomieji tyrinėjimai Kernavės archeologijos ir istorijos rezervatinio muziejaus teritorijoje ir apylinkėse 1989 metais. Ataskaita /Kernavės alkvietė, Mitkiškių gyv., Kernavės (Kriveikiškių) piliak., Ardiškio gyv., Širvintų raj., Archive of the Lithuanian Institute of History, file No. 1659, Vilnius.
Luchtanas, A., 1990, Kapinynas ir gyvenvietės Kernavėje, Pajautos slėnyje (Mitkiškių vnk.) /Širvintų raj./ 1990 metų archeologinių tyrinėjimų ataskaita, Archive of the Lithuanian Institute of History, file No. 1727, Vilnius.
Luchtanas, A., 1990, Žvalgomieji tyrinėjimai Kernavėje ir jos apylinkėse / In: Archeologiniai tyrinėjimai Lietuvoje 1988-1989 metais, Vilnius, p. 193–196.
Luchtanas, A., 1991, Kapinyno ir gyvenviečių Kernavėje, Pajautos slėnyje (Mitkiškių vnk.) /Širvintų raj./ 1991 metų archeologinių tyrinėjimų ataskaita, Archive of the Lithuanian Institute of History, file No. 1826, Vilnius.
Luchtanas, A., 1992, Kernavės pušyno prie Neries archeologiniai tyrinėjimai 1991 m. / In: Archeologiniai tyrinėjimai Lietuvoje 1990-1991 metais, Vol. 1, Vilnius, p. 27–29.
Luchtanas, A., 1997, Kernavės senovės gyvenvietės (AR 1660) 1997 m. archeologinių tyrinėjimų ataskaita, Archive of the Lithuanian Institute of History, file No. 2956, Vilnius.
Luchtanas, A., 1998, Gyvenviečių ir kapinyno tyrinėjimai Kernavėje, Pajautos slėnyje, 1996 ir 1997 metais / In: Archeologiniai tyrinėjimai Lietuvoje 1996-1997 metais, Vilnius, p. 82–86.
Luchtanas, A., 2004, Gyvenviečių tyrinėjimai Kernavėje, Pajautos slėnyje / In: Archeologiniai tyrinėjimai Lietuvoje 2003 metais, Vilnius, p. 43–45.
Vengalis, R., 2011, Kernavės senovės gyvenvietės ir miesto archeologiniai tyrimai magnetinių anomalijų vietose / In: Archeologiniai tyrinėjimai Lietuvoje 2010 metais, Vilnius, p. 83–87.
Vengalis, R., 2014, Žvalgomieji tyrimai Neries slėnyje, tarp Dūkštų ir Čiobiškio / In: Archeologiniai tyrinėjimai Lietuvoje 2013 metais, Vilnius, p. 105–120.
Vengalis, R., 2014, Tyrimai Kernavės senovės gyvenvietėje / In: Archeologiniai tyrinėjimai Lietuvoje 2013 metais, Vilnius, p. 98–104.
Vengalis, R., 2015, Žvalgomieji tyrimai Ardiškyje / In: Archeologiniai tyrinėjimai Lietuvoje 2014 metais, Vilnius, p. 68–71.
Vengalis, R., 2015, Žvalgomieji tyrimai Kernavės apylinkėse / In: Archeologiniai tyrinėjimai Lietuvoje 2014 metais, Vilnius, p. 105–117.
Vengalis, R., 2016, Mitkiškių senovės gyvenvietė / In: Archeologiniai tyrinėjimai Lietuvoje 2015 metais, Vilnius, p. 86–91.
Vėlius, G., Vengalis, R., 2016, Tyrimai Kernavės archeologinėje vietovėje / In: Archeologiniai tyrinėjimai Lietuvoje 2015 metais, Vilnius, p. 141–148.

archaeology was published[31]. The area of concern was included in the archaeological maps as yielding some archaeological data of various Final Palaeolithic–Early Mesolithic cultures, that were already previously described[32] by the archaeologist herself (Maps 7–10).

In the beginning of a new century some survey investigation was done in the lower reaches of river Neris[33]. Some areas were considered as being not worthy to be under the State protection. Two decades ago a new generation of Stone Age archaeologists in Lithuania started their investigations in a range of newly discovered and rediscovered sites. Several studies on Late Palaeolithic and Mesolithic archaeology were introduced[34]. The basic periodization and cultural classification of Late Palaeolithic–Early Mesolithic was revised and clarified by E. Šatavičius: remains of five archaeological cultures were identified in the archaeological record, three of them – Swiderian, Ahrensburgian and Brommean – were confirmed to have existed in the area of focus. A major change was proposed: oppositely than it was thought before, the Swiderian points with tightened tang were suggested to be regarded as earlier than the ones with not tightened tang. Therefore the inventories from Skaruliai, Drąseikiai, Eiguliai and other sites were reconsidered.

Some sites in the western part of the river Neris basin were excavated by E. Šatavičius himself. Thanks to the big efforts put in by him in the detailed reseach of the Final Palaeolithic and Early Mesolithic sites[35], up until today data from Pasieniai 1, Neravai, Skaruliai 2 sites became a new basis for further

[31] Rimantienė, R., 1984, Akmens amžius Lietuvoje, Vilnius.

[32] Римантене, Р., 1971, Палеолит и мезолит Литвы, Вильнюс.

[33] Brazaitis, Dž., 2004, Pabartonių akmens amžiaus gyvenvietės (AR 212) žvalgomųjų tyrinėjimų ataskaita, Archive of the Lithuanian Institute of History, file No. 4185, Vilnius.
Brazaitis, Dž., 2004, Archeologiniai tyrinėjimai Lietuvoje 2003 metais, Vilnius, p. 310, 1 lent.

[34] Šatavičius, E., 1997, Vėlyvoji Svidrų kultūra / In: Kultūros paminklai, Vilnius, Vol. 4, p. 3–15.
Ostrauskas, T., 1998, Lietuvos mezolito gyvenviečių periodizacija / Doctoral dissertation, Vilnius University, Vilnius.
Ostrauskas, T., 1999, Vėlyvasis paleolitas ir mezolitas Pietų Lietuvoje / In: Lietuvos archeologija, Vol. 16, p. 7–11.
Šatavičius, E., 2001, Vėlyvojo paleolito kultūros ir jų likimas ankstyvajame mezolite / Doctoral dissertation, Vilnius University, Vilnius, 135 p.
Ostrauskas, T., 2002, Kundos kultūros tyrinėjimų problematika / In: Lietuvos archeologija, Vol. 23, Vilnius, p. 93–106.
Ostrauskas, T., 2002, Apie vėlyvojo paleolito periodizaciją Lietuvoje. E. Šatavičiaus koncepcijos kritika / In: Lietuvos archeologija, Vol. 23, Vilnius, p. 239–246.
Šatavičius, E., 2005, Svidrų kultūra Lietuvoje / In: Lietuvos archeologija, Vilnius, Vol. 29, p. 133–170.

[35] Marcinkevičiūtė, E., 2011, Skarulių pilkapių vietos tiesiant Jonavos pietrytinį aplinkkelį (kelio A6 Kaunas-Zarasai-Daugpilis 32,7-32,9 km ruožas) archeologinių tyrimų 2009-2010 m. ataskaita, Archive of the Lithuanian Institute of History, file No. 91228, Vilnius.
Šatavičius, E., Marcinkevičiūtė, E., 2011, Skarulių pilkapių vietos tyrimai 2009–2010 metais / In: Archeologiniai tyrinėjimai Lietuvoje 2010 metais, Vilnius, p. 102–113.
Marcinkevičiūtė, E., Šatavičius, E., 2013, Skarulių pilkapių vietos tyrimai / In: Archeologiniai tyrinėjimai Lietuvoje 2012 metais, Vilnius, p. 23–26.
Marcinkevičiūtė, E., Šatavičius, E., 2014, Skarulių pilkapių vietos tyrimai / In: Archeologiniai tyrinėjimai Lietuvoje 2013 metais, Vilnius, p. 23–27.
Marcinkevičiūtė, E., Šatavičius, E., 2015, Skarulių pilkapių vietos tyrimai / In: Archeologiniai tyrinėjimai Lietuvoje 2014 metais, Vilnius, p. 57–62.

investigation. In addition to the flint collections from previously discovered sites, these archaeological objects were analyzed in the scientific literature for the past two decades and were titled as the most important known sites in Lithuania (Maps 12–15, 18–21).

In the last decades few archaeologists have been making surveys and excavations in the western part of the river Neris basin with an aim to discover and investigate new Stone Age sites or to localize the previously discovered archaeological objects[36]. Starting from 2013 various places in the river Neris valley were visited by the author of this study for many times. However, some of the previously well known sites were almost impossible to localize due to urbanization and gravel mining processes that have changed the landscape. Also some of the location descriptions made many years ago were not full enough and lacked a more detailed information for an exact adaptation to the newest local plans and maps.

Another detailed investigation was carried out by the author of this study in 2012–2016 in Pabartoniai 1 site on the right river Neris bank and in Dūkšteliai 1 site, situated in the upper reaches of the river Neris tributary

[36] Brazaitis, D., 2008, Žvalgomieji tyrinėjimai Pasienių akmens amžiaus gyvenvietės aplinkoje / In: Archeologiniai tyrinėjimai Lietuvoje 2007 metais, Vilnius, p. 28–31.
Gudaitienė, G., 2015, Dūkštelių akmens amžiaus gyvenvietė 1 / In: Archeologiniai tyrinėjimai Lietuvoje 2014 metais, Vilnius, p. 28–32.
Gudaitienė, G., 2015, Pabartonių akmens amžiaus gyvenvietė / In: Archeologiniai tyrinėjimai Lietuvoje 2014 metais, Vilnius, p. 32–38.
Gudaitienė, G., 2016, Pabartonių akmens amžiaus gyvenvietės I ir II / In: Archeologiniai tyrinėjimai Lietuvoje 2015 metais, Vilnius, p. 26–31.
Guobytė, R., Rimkutė, G., 2013, Aerofotonuotraukų stereoskopinės analizės panaudojimas archeologiniuose tyrimuose / In: Metodai Lietuvos archeologijoje. Mokslas ir technologijos Lietuvos praeičiai pažinti, p. 606–617.
Luchtanas, A., 1992, Kernavės pušyno prie Neries archeologiniai tyrinėjimai 1991 m. / In: Archeologiniai tyrinėjimai Lietuvoje 1990-1991 metais, Vol. 1, Vilnius, p. 27–29.
Marcinkevičiūtė, E., Šatavičius, E., 2013, Skarulių pilkapių vietos tyrimai / In: Archaeologiniai tyrinėjimai Lietuvoje 2012 metais, Vilnius, p. 23–26.
Marcinkevičiūtė, E., Šatavičius, E., 2014, Verbiškių gyvenvietės 1 ir jos aplinkos žvalgomieji tyrimai / In: Archaeologiniai tyrinėjimai Lietuvoje 2013 metais, Vilnius, p. 27–29.
Marcinkevičiūtė, E., Šatavičius, E., 2014, Skarulių pilkapių vietos tyrimai / In: Archaeologiniai tyrinėjimai Lietuvoje 2013 metais, Vilnius, p. 23–27.
Marcinkevičiūtė, E., Šatavičius, E., 2015, Skarulių pilkapių vietos tyrimai / In: Archaeologiniai tyrinėjimai Lietuvoje 2014 metais, Vilnius, p. 57–62.
Rimantienė, R., 1997š, Skarulių senovės gyvenvietės, Jonavos miestas, archeologinių žvalgomųjų tyrinėjimų 1997 metais ataskaita, Archive of the Lithuanian Institute of History, file No. 2817.
Rimkutė, G., 2013, Skauduliškių–Dūkštelio ežerų mikroregiono žvalgomieji tyrimai / In: Archeologiniai tyrinėjimai Lietuvoje 2012 metais, Vilnius, p. 587–590.
Rimkutė G., 2014, Dūkštelių akmens amžiaus gyvenvietės 1 kasinėjimai / In: Archeologiniai tyrinėjimai Lietuvoje 2013 metais, Vilnius, p. 40-43.
Strimaitienė, A., 2003, Žvalgymai Jaros ir Maleišos upių slėniuose (Anykščių r.) / In: Archeologiniai tyrinėjimai Lietuvoje 2002 metais, Vilnius, p. 291–294.
Šatavičius, E., 1992, Pasienių I mezolitinės stovyklavietės tyrinėjimai / In: Archeologiniai tyrinėjimai Lietuvoje 1990-1991 metais, Vol. 1, Vilnius, p. 34–37.
Šatavičius, E., 1994, Pasienių 1-osios akmens amžiaus gyvenvietės tyrinėjimai / In: Archeologiniai tyrinėjimai Lietuvoje 1992-1993 metais, Vilnius, p. 34–36.
Šatavičius, E., 1998, Pasienių 1-osios akmens amžiaus gyvenvietės tyrinėjimai / In: Archeologiniai tyrinėjimai Lietuvoje 1996-1997 metais, Vilnius, p. 41–43.
Šatavičius, E., 2002, Pasienių 1-osios akmens amžiaus gyvenvietė / In: Archeologiniai tyrinėjimai Lietuvoje 2001 metais, Vilnius, p. 34–36.
Šatavičius, E., Marcinkevičiūtė, E., 2011, Skarulių pilkapių vietos tyrimai 2009-2010 metais / In: Archaeologiniai tyrinėjimai Lietuvoje 2010 metais, p. 102–113.
Vengalis, R., Juškaitis, V., Pilkauskas, M., Kozakaitė, J., 2016, Kvietinių senovės gyvenvietė ir pilkapynas / In: Archeologiniai tyrinėjimai Lietuvoje 2015 metais, Vilnius, p. 74–86.
Vengalis, R., 2014, Žvalgomieji tyrimai Neries slėnyje, tarp Dūkštų ir Čiobiškio / In: Archeologiniai tyrinėjimai Lietuvoje 2013 metais, Vilnius, p. 105-120.
Vengalis, R., 2016, Mitkiškių senovės gyvenvietė / In: Archeologiniai tyrinėjimai Lietuvoje 2015 metais, Vilnius, p. 86-91.

called Dūkšta[37]. Both sites were excavated up to 100 m^2 and yielded some archaeological material important to interdisciplinary research (AMS ^{14}C dating, chemical and physical soil composition, archaeobotany and other methods of investigation).

It seems most likely that a big part of the Palaeolithic and Mesolithic sites along the river Neris cannot be further investigated and the scientific research can only be done on the flint assemblages still kept in the museums. An expectancy to discover still unknown sites is also relatively small as the banks of the river Neris and its tributaries are being intensively urbanized every year. Whereas surveys in the areas around the previously existed lakes might be very promising.

3. METHODS

The following methods and activities were proposed to be utilized as part of this research, in consideration of the limitations imposed by the mixed stratigraphy of the sandy river banks of the Neris and the availability of the former archaeological data kept in the museums. Most of the following methods were applied on the archaeological data lately excavated in Dūkšteliai 1 and Pabartoniai 1 sites.

3.1 **Typological identification of the finds** recovered from sites in the region in the 20th century and the past decades allowed to provide an updated interpretation of the tool collections and their chronology (see '*Database*' in CD, Tables 6–8). All the flint and other rock artefacts were taken in consideration without any predetermined point of view and analyzed before

[37] Gudaitienė, G., 2015, Pabartonių akmens amžiaus gyvenvietė / In: Archeologiniai tyrinėjimai Lietuvoje 2014 metais, Vilnius, p. 32–38, Vilnius.
Gudaitienė (buv. Rimkutė), G., 2015, Pabartonių akmens amžiaus gyvenvietės (Jonavos r. sav.) archeologinių detaliųjų ir žvalgomųjų tyrimų 2014 m. ataskaita, Archive of the Lithuanian Institute of History, file No. 39-1-4498.
Gudaitienė, G., 2015, Dūkštelių akmens amžiaus gyvenvietė 1 / In: Archeologiniai tyrinėjimai Lietuvoje 2014 metais, Vilnius, p. 28–32.
Gudaitienė, G., 2016, Pabartonių akmens amžiaus gyvenvietės I ir II / In: Archeologiniai tyrinėjimai Lietuvoje 2015 metais, Vilnius, p. 26–31.
Gudaitienė, G., 2016, Pabartonių akmens amžiaus gyvenviečių, Pabartonių k., Jonavos r. sav., detaliųjų archeologinių tyrimų 2015 m. ataskaita, Archive of the Lithuanian Institute of History.
Gudaitienė, G., 2017, Pabartonių akmens amžiaus gyvenvietė I / In: Archeologiniai tyrinėjimai Lietuvoje 2016 metais, Vilnius, p. 26–31.
Gudaitienė, G., 2016, Rediscovering the Final Palaeolithic–Mesolithic at Pabartoniai, a site on the River Neris / In: Archaeologia Lituana, Vol. 17, Vilnius, p. 35–56.
Gudaitienė, G., 2017, Dūkštelių senovės gyvenvietė / In: Archeologiniai tyrinėjimai Lietuvoje 2016 metais, Vilnius, p. 24–26.
Rimkutė, G., 2013, Skauduliškių–Dūkštelio ežerų mikroregiono žvalgomieji tyrimai / In: Archeologiniai tyrinėjimai Lietuvoje 2012 metais, Vilnius, p. 587–590.
Rimkutė, G., 2014, Dūkštelių akmens amžiaus gyvenvietės 1 kasinėjimai / In: Archeologiniai tyrinėjimai Lietuvoje 2013 metais, Vilnius, p. 40–43.

comparing the results with the previously published interpretations. Three main issues were apparent after the archaeological data revision:

1) the distinction of the differently dated tool assemblages and the search for the material that can be ascribed to the earliest inhabitance phase of the sites whilst eliminating the finds typologically dating to the Late Mesolithic–Bronze Age;
2) typological interpretation of the artefacts and their fragments and a search for still unrecognized or misinterpreted flint tools;
3) consideration of the missing or lost flint artefacts (after the comparison with the former published data).

The chronological and cultural ascription of the flint finds was mainly based on the evidence of the used flint knapping and tool making technologies. The shape and size of the artefacts was sometimes considered as important, yet was not the main criteria when distinguishing the assemblages related to one or another archaeological culture. As the main topic of this study was not the analysis of various Final Palaeolithic–Early Mesolithic archaeological cultures, the up-to-date tool identification criteria published in many archaeological studies of the past decades[38] were taken as a basis. It has to be noted that the Final Palaeolithic industries recorded in Lithuania which were different from Swiderian by the terms of technology, were and still are the objects of discussion. Five decades ago they were titled as *Peribaltic Magdalenian* by R. Rimantienė, and later were ascribed to the Brommean and Ahrensburgian cultures well known in Germany and Denmark. Until today the question how these lithic assemblages found in Lithuanian territory should be called (Brommean, Ahrensburgian, Krasnoselye, Eastern Ahrensburgian, or else) is

[38] Taute, W., 1968, Die Stielspitzen-Gruppen im Nördlichen Mitteleuropa. Ein Beitrag zur Kenntnis der späten Altsteinzeit / Fundamenta, A-5, Böhlau, Verlag, Köln, Graz.
Kozłowski, S. K., 1975, Cultural Differentiation of Europe from 10th to 5th Millennium B.C. (Zróżnicowanie kulturowe Europy w X-V tysiącleciach P.N.E.), Warsaw.
Rimantienė, R., 1984, Akmens amžius Lietuvoje, Vilnius, 342 p.
Šatavičius, E., 1997, Vėlyvoji Svidrų kultūra / In: Kultūros paminklai, Vilnius, Vol. 4, p. 3–15.
Kozłowski, S. K., Gurba, J., Zaliznyak, L. L. (eds.), 1999, Tanged points cultures in Europe, Vol. 13, Lublin, 364 p.
Šatavičius, E., 2001, Vėlyvojo paleolito kultūros ir jų likimas ankstyvajame mezolite / Doctoral dissertation, Vilnius University, Vilnius, 135 p.
Ostrauskas, T., 2002, Kundos kultūros tyrinėjimų problematika / In: Lietuvos archeologija, Vol. 23, Vilnius, p. 93–106.
Ostrauskas, T., 2002, Apie vėlyvojo paleolito periodizaciją Lietuvoje. E. Šatavičiaus koncepcijos kritika / In: Lietuvos archeologija, Vol. 23, Vilnius, p. 239–246.
Šatavičius, E., 2005, Svidrų kultūra Lietuvoje / In: Lietuvos archeologija, Vilnius, Vol. 29, p. 133–170.
Girininkas, A., 2009, Lietuvos archeologija: Akmens amžius, Vilnius, Vol. 1, 328 p.

unsolved[39] and deserves a separate study. This issue was not an object of this thesis, therefore it was decided to apply the classification proposed by E. Šatavičius (formed on the basis of comparing tool knapping technologies) with respect to the fact that in the future some assemblages which were titled as *Brommean* or *Ahrensburgian* might be renamed. The following aspects were considered with minor nuances:

1. The double-platform core knapping technique was considered as rather implicating Final Palaeolithic or Early Mesolithic dating; on contrary, a very regular blade production technique was in most cases interpreted as not earlier than Mesolithic;
2. Various flakes, semi-regular blades, non-identifiable blanks and decortication flakes/blades were reservedly interpreted as artefacts of a wide scale dating, starting from Final Palaeolithic and ending in Bronze Age;
3. The blanks produced by anvil technology were considered as Neolithic, thus, were not taken into account;
4. Some indescribable form tools made of small flakes (usually with all perimeter retouched) were rather ascribed to Late Neolithic or Bronze Age;
5. Artefacts with obvious secondary and tertiary retouch (negatives not covered by an inherent intensity patina) were considered as used in two different periods, and only the primary tool form and function was analyzed.
6. Some tools made of the same flint nodule were interpreted as belonging to the same tool production episode and to the same one stage of site settling as well;
7. Crested blades were related to double-platform and unipolar core preparation process, therefore were more likely ascribed to Final

[39] Zaliznyak, L., 2000, R. Rimantienė as founder of the periodization of the Final Palaeolithic of North-West Eastern Europe / In: Lietuvos archeologija, Vol. 19, Vilnius, p. 31–45.
Ostrauskas, T., Vėlyvasis paleolitas ir mezolitas Pietų Lietuvoje / In: Lietuvos archeologija, Vol. 16, p. 7–17.
Ivanovaitė, L., Riede, F., 2018, The Final Palaeolithic Hunter-Gatherer Colonisation of Lithuania in Light of Recent Palaeoenvironmental Research / In: Open Quaternary, No. 4:4, p. 1–21.

Palaeolithic–Mesolithic debitage;

8. Flint patinization criteria was taken into consideration only when some visual similarities in color of several tools were apparent;
9. The tanged points were related to the earliest stages of site settling in Final Palaeolithic and Early Mesolithic:
    9.1 Tanged points of rough proportions, made on flakes or wide non-regular blades produced from one- or double-platform cores, that had a tang formed with abrupt retouch from dorsal side, were ascribed to Brommean culture and were dated to Final Palaeolithic (Allerød–beginning of Younger Dryas). These finds were rare in the area of study, thus the other features common to Brommean tool production technique were not analyzed as they were not apparent;
    9.2 Tanged points of slender proportions than Brommean points, made on narrow semi-regular or non-regular blades produced from one-/double-platform cores, that had a tang formed with abrupt retouch from dorsal side only and sometimes a tip retouched from dorsal side, were ascribed to Ahrensburgian culture and were dated to Final Palaeolithic (Younger Dryas–beginning of Preboreal);
    9.3 Tanged points of leaf-form, made on semi-regular or non-regular blades produced from one-/double-platform cores, that had a tang formed with abrupt retouch from dorsal side, a bulb part flattened from ventral side with flat retouch, and sometimes a retouched tip, were ascribed to Swiderian culture and were dated to Final Palaeolithic (Younger Dryas–beginning of Preboreal);
    9.4 Swiderian points were sorted into two main types: with a tighten tang (ascribed to the earlier phase, dating to Younger Dryas) and with a not tighten tang (ascribed to the later phase, dating to Preboreal);
    9.5 Long tanged points of a leaf-form, made on very regular blades

produced from unipolar cores, that had a tang, a tip, and sometimes the whole body retouched with flat retouch for clear aesthetical rather than practical purpose, were ascribed to Kunda culture and dated to the first part of Mesolithic (Proboreal–Boreal);

9.6 Various lancets and microliths found in the mixed collections where Neolithic or Bronze Age settling stage was identified, were related to the later periods than Mesolithic;

9.7 Some microliths (e.g. tall and narrow trapezes) found in the context of other early finds assemblage, were reservedly interpreted as possibly related to the Final Paleolithic or Early Mesolithic settling stage;

9.8 Tanged points with a non-tighten tang and a bulb part flattened from ventral side, that were made on regular blades and were formed with marginal and flat retouch from ventral side for either aesthetical or practical purpose, were reservedly interpreted as Late Swiderian tools with some features of the tool production techniques adapted from Kunda culture people. They were interpreted as coexsistant with Kunda culture and were dated to the Early Mesolithic (Preboreal–Boreal) respectively;

10. Scrapers with the working edge formed in the proximal end of a blade, were interpreted as rather common to the Final Palaeolithic and Early Mesolithic;
11. Dihedral burins and burins formed on a break or on a truncation were related to Final palaeolithic and Mesolithic on the basis of the blank type. Burins formed on very regular blades were rather considered as Mesolithic;
12. Burins, scrapers, as well as other tools were not directly related to some particular archaeological cultures, as on most cases they could have been regarded as common to more than one culture. However, after identifying some tools made on blanks of the same one core, they were

related to the same archaeological culture, if one was distinguished.

13. The flint material feature similarities considered were as follows: an orange coloring, frequent white dots, stripes or chalky inclusions, etc.

The interpretations were also based on the knowledge and artefact identification skills gained after the study of the lithic collections of Swiderian, Federmesser, Ahrensburgian and Brommean sites excavated in Lithuania and Germany, and the published data.

The results of the classification were limited on one hand, as the lithic assemblages from many sites were known to be not fully collected, therefore statistic countings on the amounts of particular types of finds were not done as they would not be as representative as one could expect. However, insights on the relatively visible larger or smaller amounts of some types of finds were provided. On the other hand, a lot of classification results encompassed broader chronological intervals, and they should be also evaluated reservedly. The interpretations given in this study are far from being unquestionable or exact, yet they are given after all the lithic finds (tools, cores, blades, flakes, etc.) were analyzed and compared.

3.2 **Drawing of flint tools** found in various Stone Age sites in the territory under concern was firstly important for the thorough examination of each flint artefact. It was also crucial for taking into consideration all the flint tool assemblage of the sites as it has only previously been part published emphasizing only the most common tool types (points, scrapers, burins and some other). What is more, most of the already published flint tool drawings depicted only the frontal view of the finds, without showing their profile or reverse. Some of the previously published drawings were re-drawn for one or even several times and the pictures lost some of very important details (unclear knapping direction, unnoticeable retouch or utilization marks, etc.). Therefore it was not useful to study the archaeological material only by looking at the pictures in the literature. Moreover, in few cases it was possible to refit a broken flint artefact only after drawing its pieces kept in different places in the

museum as two individual finds (e. g. a tool, known as 'retouched blade' occurred to be a medial part of a drilling tool).

This method of research allowed to study each removal on a given artefact, which would build an understanding of the utilized flint knapping techniques. Moreover, it has lead to the ability to classify material typologically to different periods of occupation. That was crucial for the multi-occupation sites along the river Neris, where the flint finds are situated in mixed stratigraphy. Lastly, the drawings of almost 2000 flint artefacts were made to create a nearly full album of the Palaeolithic–Mesolithic finds discovered in the western part of the river Neris basin, that would be an useful tool for future analysis.

3.3 **Excavation of newly discovered sites** in Pabartoniai and Dūkšteliai was the most time consuming, however, also the most useful method of research in this project. With new archaeological material excavated, it was assumed that interpretations on the previously discovered sites could be done as they might be compared not only with each other, but also with the latest data. Both sites – Pabartoniai 1 and Dūkšteliai 1 – were chosen within the territory of focus, but with sufficient differences which allowed an interesting comparison: one was on the lower reaches of a tributary of Neris, and the other was on the tributary riverhead. By examining flint material and the features left behind by prehistoric people between these two sites, it was possible to make presumptions on the importance of the great river and its tributary. It was also assumed that there might be significance discovered relating to hunting tra–ditions and seasonal activities.

Excavations were carried out in 2012–2016 and during the five seasons 100 m^2 were investigated in each site. The sites differed in a lot of perspectives:

- Pabartoniai 1 site yielded approximately ten times more flint artefacts than Dūkšteliai 1 site;
- Dūkšteliai 1 site was covered by comparatively thinner layer of sand;

- Dūkšteliai 1 site was much more disturbed by 20th century activities;
- Both sites were situated in a different landscape: Dūkšteliai 1 site was on a bank of a previously existed lake, whereas Pabartoniai 1 was located on a river Neris terrace, close to the lower reaches of its tributary.

However, the sites had also some things in common:

- on both sites the earliest finds were mixed together with some later material (Neolithic–Bronze Age or even later);
- some clear flint artefacts concentrations were uncovered in both sites;
- flint finds assemblage was supported by other types of finds: burnt bone material, stone artefacts, charcoal pieces;
- none of the sites was excavated before;
- in both sites some distracting objects were found (features of a later phase of inhabitance, bioturbations, etc.).

The excavations in Pabartoniai 1 and Dūkšteliai 1 sites were conducted by the author of this study with a help of many students and volunteers.

3.4 **Comparison of previously collected and newly recovered archaeological material** was chosen in order to assess what may have been lost from sites now destroyed, and to determine if new sites could provide suitable analogues in the same region, adding to the interpretation of data from the lost sites. It was assumed that this method would also contribute to the discussion of whether different find spots and sites along the river Neris relate to different populations or the same community of people, and over what period of time the archaeological material accumulated.

Pabartoniai 1 site was chosen to make a comparison among the Final Palaeolithic–Early Mesolithic sites in the river Neris valley (e.g. Eiguliai, Skaruliai, Radikiai, etc.) possible. Whereas Dūkšteliai 1 site was situated in a different landscape and could be compared with the sites discovered further away from the big river valleys, in the areas where lakes had previously existed.

It was presumed that the newly excavated sites would yield additional

archaeological data: some organic material for AMS ^{14}C dating, non-flint stone artefacts, plant remains or bone artefacts. Uncovered prehistoric features would potentially allow a Stone Age site installation plan simulation that could be taken as a comparative basis for the reconstruction of the other sites with the same flint assemblage along the river Neris. The following questions were raised as the hypotheses for this study:

- Could the similar sites be considered as belonging to the same groups of people or were they different and had nothing in common except of being situated in the river Neris basin?
- Is it still possible to date the lost sites on the basis of comparative data?
- Were the sites along the river Neris closely related with each other? Maybe some of them should be regarded as parts of one complex of sites?
- Was the 'flint exploitation issue' same important to all of the sites to the north from the river Neris (in a non-flinty territory) or were there differences among the sites in this perspective?

The sites in Skaruliai and Neravai villages recently excavated by E. Šatavičius were also taken into comparisson with the data obtained from the rest of the archaeological objects recorded in the territory of concern when discussing the range of settlement types and the basic characteristics of long-term and short-term site establishment.

3.5 **AMS ^{14}C dating** was regarded as one of the most important methods that could be utilized for the objects recovered in the sites excavated during the course of the last five years as part of the investigation of settling in the primeval basin of river Neris. This component of the research was considered a priority to be undertaken, as none of the sites in the discussed territory have previously been dated and their chronology was based only on flint typology (primarily point types). There were also collections of hunting tools that had no known chronological association due to being collected from the surface.

Currently the only way to date these collections was through comparison with the tool inventory in recently excavated and dated sites, which are outside the region of interest. Therefore samples that comprised charcoal recovered from burnt objects where flint finds were present (also in some instances associated with burnt bone, ochre and burnt hazelnuts) were thoroughly collected during the excavation in Pabartoniai 1 and Dūkšteliai 1 sites. Following this dating, chronological analysis of the settling of the river Neris basin could be made. In addition, collaboration with AMS radiocarbon dating laboratory specialists was a useful way to develop greater knowledge of this method and to study how samples are prepared.

In total 26 samples were taken for a research (8 from Dūkšteliai 1 site, 1 from previously existed Dūkštelis lake deposits, and 17 from Pabartoniai 1 site). The results allowed to chronologically discern different episodes of settling of the sites and to recognize correlations between some certain features (Tables 4–5). The samples were investigated in various laboratories: Poznan Radiocarbon Laboratory (Poznańskie Laboratorium Radiowęglowe), The Leibniz Laboratory for Radiometric Dating and Stable Isotope Research (Leibniz Labor für Altersbestimmung und Isotopenforschung), Radiocarbon dating Laboratory in the Center for Physical Sciences and Technology, Vilnius (Radio anglies datavimo laboratorija, Fizinių ir technologijos mokslų centras) and Köln Radiocarbon Laboratory (Zentrum für Beschleuniger-Massenspektrometrie). The results mostly correlated with the predetermined interpretation on the chronology of the first and later settling phases in the Pabartoniai 1 and Dūkšteliai 1 sites. However, in some cases the datings appeared to be not exact due to sample pollution and few samples have shown different values from what was presumed. After examining the two sites a multilayered type of inhabitance was determined in both of them, with the dates reaching Early Mesolithic period at the earliest.

3.6 **Microscopic analysis of some artefacts** was carried out on material from newly excavated site in Dūkšteliai and several artefacts from Skaruliai 1 and

Eiguliai 1 sites. The analysis on some flint and one schist artefact use-wear were made under the Olympus SZX10 microscope at Vilnius University, Faculty of History and under an Olympus SZX16 microscope at Klaipėda University, Institute of Baltic Region History and Archaeology. The view was magnified between 10x and 40x depending on the features of traces taken into consideration. Some results on the flint artefacts from Dūkšteliai 1 site were discussed with Prof. A. Girininkas.

The main purpose of the investigation was to determine the function of the artefacts. A schist pebble from Eiguliai 1 site was analyzed in order to distinguish and draw its use-wear traces and to prove or deny the former presumptions on its function. It was done after keeping this artefact in the Vytautas the Great War Museum in Kaunas for more than 50 years. Nevertheless, the traces of use-wear on this find's surface were still in a suitable condition for investigation. The same analysis was applied to the notched blade fragment discovered in Skaruliai 1 site (see section *'Intelectual basis of the first inhabitants. Art'*). This artefact was also kept in a box among other flint implements in the National Museum of Lithuania, yet most probably the most limiting factor for the analysis was unfavorable post-depositional processes that affected this archaeological find as it was found laying on the sandy ground surface.

After the examination of the flint finds from Dūkšteliai 1 site some additional tool types were discovered, more than there were previously identified on the basis of the tool forms. Some aspects of utilization of retouched blades and flakes were revealed by examining their use-wear under the microscope. Moreover, in some cases a re-use of a few tools in later periods (Neolithic?) was determined, highlighting the importance of comparing Final Paleolithic–Early Mesolithic hunter gatherer and Neolithic–Bronze Age populations' economical decisions related to dependence on flint exploitation.

3.7 **Archaeobotanical analysis** was proposed to be undertaken with the perspective to recover plant remains in the burnt objects of recently excavated

Dūkšteliai 1 and Pabartoniai 1 sites. Fragments of identified plant species were supposed to be radiocarbon dated to reveal their chronological affiliations to either the first inhabitants of the site or later communities. Burnt pieces resembling plant parenchyma were also excavated, but this identification is still under discussion.

The samples were prepared and investigated in a sequence as follows:

1) The ground sample of 10 to 30 liters were taken from the prehistoric features unearthed during the excavation;
2) Samples were floated through a 300 μm size mesh to sort off the organic material;
3) Organic material was then dried in a natural conditions (+13–27^{o}c temperature);
4) The dried material was examined under the Olympus SZX10 microscope and the plant species were identified. Burnt wood charcoal pieces were gently broken to investigate the break profile;
5) Fragments of the plants were identified using an atlas of plant species[40] and with the help of the consulting archaeobotany professionals – Dr Wiebke Kirleis and prof. Helmut Kroll (University of Kiel), Dr Dalia Kisielienė (The Nature Research Center, Vilnius) and Dr Giedrė Motuzaitė-Matuzevičiūtė Keen (The Bioarchaeology Center of Vilnius University);
6) Some plant remains were taken as samples for AMS ^{14}C dating research.

The results of archaeobotany research were scarce as it was possible to expect having in mind the sandy acidic sediment conditions – the identified plant fragments were not numerous and some of them were too fresh to be related to prehistoric times. However, some burnt wood species in the prehistoric objects were identified and dated in both excavated sites, and a hazelnut shell concentration was determined in Pabartoniai 1 site (see sections *'Dūkšteliai 1 site'* and *'Pabartoniai 1 site'*).

[40] Cappers, R. T. J., Bekker, R. M., Jans, J. E. A., 2012, Digitale Zadenatlas van Nederland. Digital seed atlas of the Netherlands, 2nd edition, Groningen.

3.8 **Geochemical and geophysical analysis of the archaeological features and their surroundings** was carried out on the sediment samples taken from Dūkšteliai 1 archaeological site. The research was done in collaboration with PhD student Laura Gedminienė (Nature Research Centre, Vilnius, Lithuania).

After examining the archaeological data some questions considering the prehistoric objects nature became important. It was assumed that the geochemical and other geophysical analyses of the sediment samples can help in formulating the interpretative answers to following questions:

a) What could be the level of anthropogenic impact on the archaeological site? Could it cause any major changes visible in chemical data?
b) Were there any significant differences in the chemical composition of the sediments taken from:
    1) the center of the archaeological feature and its periphery ground,
    2) the center of the archaeological feature and the background,
    3) various places in the background,
    4) various depth levels of the same archaeological feature,
    5) some visually connected stains?
c) Could the ratio of calcareous elements in some features be significantly higher, showing the correlation with archaeologically recorded concentration of burnt bone fragments?

Surrounding background area in Dūkšteliai 1 site (soil parent material) consisted of Quaternary deposits that were of different age, origin and lithology. The deposits were formed during the Weichselian glaciation which advanced from Scandinavia and were altered during the Late Glacial and Holocene by cryogenic, periglacial, limnic, glaciofluvial, and other natural processes. The surface deposits consisted of till, sand and clayey sand sediments. It is worth to mention that agriculture and farming have been taken up in the area at least since the beginning of the 19th century. That caused erosion and weathering of the area and changed the physical and chemical composition of the surface soil and some deeper layers in parts of the surrounding area.

Geochemical analysis, loss on ignition (LOI) and particle size determination was applied to find any elements which could be significant for interpretation but were indistinguishable during the archaeological excavation. The two latter methods have shown witch sample physical composition was reliably similar or close.

The samples for geochemical, LOI and granulometry analysis were collected from the excavated area at about 40–75 cm depth as follows: a) in the middle of a prehistoric feature, b) at the border of it, and c) in the periphery ground, that was considered as a background representing the least disturbed soil. Main trace elements Al, Ba, Br, Ca, Cl, Cr, Cu, Fe, Ga, Y, K, Mg, Mn, Na, Nb, Ni, P, Pb, Rb, Si, Sr, Ti, Zn, S were determined using energy-dispersive x-ray fluorescence Spectro Xepos equipment and the Turboquant calibration method for pressed pellets. Samples were also dried (+110º C), then heated at +550º C and +950º C to burn out the organic matter and carbonates respectively. The distribution of the fine soil fraction (<0.125 mm) was determined using a Fritsch Laser Particle Sizer 'Analysette 22', whilst the differentiation of particle size was performed on the Udden and Wentworth scale.

Specimens for geochemical analysis were milled by MM400 mixer mill in zirconium oxide grinding jars. The milled material of each sample was divided into two equal parts, then 2 g of each sub-sample and 0.25 g of Licowax binder (Fluxana) were homogenized and the 20 mm diameter pellets were pressed. In total 15 paired sub-samples were prepared.

The soil samples were analyzed using EDXRF equipment Spectro Xepos (Kleve, Germany) and the Turboquant method for the pressed pellet calibration procedure elaborated by the manufacturers (software 'XLabPro 4.5') was applied to determine the contents of chemical trace elements. Considering the variation of paired sub-samples (RSD), its median values of coefficients were counted as follows:

- <5% for Sr, Rb, Si, Fe, Mn, Y, K, Zr, Ca, Al, P, Ti;
- 5–10% for Pb, Na, Nb, Th, Mg, Ba, Zn, Ni;
- 14–48% for Sn, Mo, V, Ga, Hf, Br, Cr, Cl, Cu.

Elements with high RSD were not included into the later analysis. In order to reduce the impact of random errors, the average value of both pellet geochemical results was counted before analysis and statistical treatment. During the geochemical analysis the mass absorption coefficient of each pellet was measured to determine their homogeneity level.

The analytic software STATISTICA 9 was used to perform cluster analysis. Using Ward`s method and Euclidean distances a tree diagrams for 15 samples for calcareous elements (Ca, Mg, Sr, Ba, $CaCO_3$) was done. Using Ward`s method and Pearson r distance measure basic trace elements were classified into groups representing:

1) clay minerals – Na, Al, K, Rb, Ba;

2) carbonates – Sr, Mg;

3) silicaclastic group – Si, Zr (also included Mn);

4) group with higher amount of Fe, Ti, Ca.

On this basis the differences between variables have been revealed.

As a result, insignificant geochemical and other data difference between samples has been observed and only minor inequality of element contents was seen (Fig. 159; Table 2–3). The new data has shown that higher concentrations of clay and carbonate elements accumulated in the periphery of the archaeological features or in the background soil where the anthropogenic impact or the weathering was slighter.

Some heavy metals (Co, V, Cu, Cr, Sn, Cl) in some cases accompanied anthropogenic impact, but the valuables were not significantly large comparing with the Lithuanian soil background level. In the archaeological object stain center more organic matter was found and higher values of P, Mn, Zn were usually detected, while Ca, Sr, Mg, Ti, Si, Fe and clay elements were more common in the feature periphery or the background.

Although there were a lot of burnt bone fragments found in one of the features, no significantly high values of calcareous elements were detected. Whilst some extraordinary high amounts of Cl were found in two objects. Its correlation with bigger concentrations of Cr and V was also recorded.

Subsequent conclusions about the nature of the archaeological objects and the background in the excavated Dūkšteliai 1 site could be done. Even though some anthropo- and technogenetic activity evidence could be seen in the area, the archaeological horizon of the prehistoric settlement was not significantly polluted, so the results of geochemical analysis were more likely to be reliable. Some significant differences in the physical composition of the ground could be seen in comparing the archaeological feature content and background, but the background itself was not homogeneous. Therefore, sampling results were representatively comparable only when taken from the distance of no more than ~2 m. It was noticed that examining various depth levels of the same archaeological feature can help in detecting the most intense part of the feature or its center. The chemical composition of the object corresponded with the intensity of its visually outstanding color. In addition, the geochemical research method allowed to determine if two close features were related and could be considered as two separate fragments of the same object. Finally, on the opposite of what was presumed, the burnt bone material apparently had no impact on the archaeological feature chemical composition and no dissolved material was detected.

To sum up, the geochemical and geophysical research methods were useful for the interpretation of Dūkšteliai 1 site objects. In the future a similar investigation should be also done on the samples taken from the other excavated sites in the river Neris basin, because it allows to answer some important questions related to the site settling plan and the function of objects.

3.9 **Spatial analysis of the find distribution** was done to produce a planigraphy for the lately excavated sites, to reconstruct different archaeological horizons and to identify any concentrations of flint production. It was presumed that this would also support analysis on the correlation between flint debitage patterns of certain tool making technologies and the features present at the site, as well as aiding in the separation of approximated archaeological horizons.

The data for this modeling was recorded during the excavation using a

level, x and y axis measure instruments. Therefore the data consisted of three dimension values and additional attributes:

- the absolute height (H_{abs}),
- the stratigraphic layer where the artefact was found,
- the type of the artefact,
- information if the artefact has had an impact of fire,
- the approximate dating of the artefact based on the typology,
- find measurements.

The features listed above were taken into account while analyzing the find distribution in ArcGIS program. A range of questions were formulated to select the information needed for the site settling interpretation (e.g. where do the regular blades with an impact of fire arrange in the site in the absolute height between 61 950 and 61 700 mm / yellow fine grained sand?). It was presumed that the following features should correlate with the certain interpretations:

- The deepest stratigraphic levels or yellow/white fine grained sand should correspond to the earliest phases of site inhabitance;
- Typologically dated finds should be distributed relatively close to the features dated to the same period;
- The finds distributed in a relation to a certain feature could be dated the same as the organic samples dates according to the AMS ^{14}C dating;
- The regular blades could correspond with the Mesolithic site settling;
- The burnt artefacts (flint and bone) should most likely correspond with the burnt objects of function related to fire making and food preparation;
- The flint find concentrations might implicate flint knapping zones;
- The concentration of burnt hazelnut shells could be considered as a nut eating / preparation zone;
- The distribution of flint cores and their fragments might show the flint knapping zones or their periphery if found concentrated;
- The certain flint implements could be attributed to the places where a

particular activity took place (e.g. a concentration of scraping tools should be related to a hide working activity zones);

- A concentration of flint finds might be considered as one only if it is clearly visible in some certain stratigraphic level;
- The flint tools found in the center of an archaeological feature should be most likely related to that object;
- Artefacts found in the upper layers (higher that the prehistoric feature horizon) should be related to the archaeological objects in a distance of few metres and could be considered as being moved by bioturbations. Therefore they can only be partly taken into account when analyzing the find concentrations.

The data was analyzed on the basis of the interpretations listed above and a reconstruction of the site settling phases and feature plans was then simulated. This method has helped in understanding the multiple settling of the excavated sites and was only possible due to the thoroughly saved data notwithstanding the sandy nature of the site stratigraphy and bioturbations.

3.10 **The analysis of LiDAR images of earth surface** was applied to examine the geomorphology of the discussed territory, to review the whole area as a river basin and to determine its possible hydrographic changes throughout the Holocene. The landscape and elevations that were relevant for first inhabitants could also be analyzed. Moreover, some probable mobility routes along the tributaries of the river Neris and the most convenient areas for settlement could be distinguished.

The LiDAR view was analyzed after the map sheets of .hfz formate were inserted and conjoined in the Global Mapper.12 application. The water level was then raised and lowered within the limits of few metres to see the possible riverbed extension and its relation with the sites situated on the river banks. Also the present-day non-existing water bodies, especially lakes, as well as some destroyed or damaged river terraces and the river watercourses in meliorated areas could be identified after analyzing the LiDAR image of the

territory. It was also a convenient instrument to determine the surface altitudes and to identify the river terrace level or a probable chronological terrace formation sequence. In reconstruction of the Pabartoniai 1 site environment the LiDAR view was discussed with geologist Prof. P. Šinkūnas (Institute of Geosciences, Vilnius University).

As a result of the analysis of LiDAR view of the surface, the correlation between some of the sites distribution and the intersections between the rivers was apparent. Therefore it was presumed that in the river Neris basin the places where a tributary flows into a bigger river are the most likely to have been settled in the Stone Age. In addition, most of the earliest sites were located on the first or second river terrace, and rarely could it be found higher. It was also noticed that the sites were facing various directions, however, it was always a water body as the main feature of attraction.

3.11 **Aerial photo stereoscopy analysis** was another method used for the similar purposes as the LiDAR system. It was utilized on the panchromatic photos of 1952–1958 to reconstruct previous landscape of Dūkšteliai 1 archaeological site environment and to examine suitable places for settlements or camps[41]. The analysis was done in collaboration with Dr Rimantė Guobytė (Lithuanian Geological Survey under the Ministry of Environment, Vilnius). The photos were analyzed under the stereoscope and a probable contour of the previously existed Dūkšteliai lake with its terraces was then drawn on the basis of a 3D relief view, the growing flora type and identified wet ground areas. The correlation between the lake shoreline and the Stone Age settlements (Mesolithic as well as Neolithic) distribution became apparent. The simulated lake extent area was also checked by drilling the test boreholes later[42].

This method allowed to reveal the location of previously extinct lakes and ancient topographical features, such as the most accessible routes across the

[41] Guobytė, R., Rimkutė, G., 2013, Aerofotonuotraukų stereoskopinės analizės panaudojimas archeologiniuose tyrimuose / In: Metodai Lietuvos archeologijoje (ed. A. Merkevičius), Vilnius, p. 606–617.

[42] Gedminienė, L., Gudaitienė, G., Zinkutė, R., Taraškevičius, R., Stančikaitė, M., 2015, Anthropogenic Impact or Natural Environmental Change: New Data Based on Palaeobotanical and Geochemical Analysis of Dūkštelis Lake Sediments / poster presentation in: INQUA Peribaltic Meeting, Netherlands, November 2–8.

landscape. It has provided a more accurate view of the landscape as it was prior to the drainage of bogs in modern times. Also, in the future the simulated map can be used for forecasting more potential Stone Age site places along the shoreline.

3.12 **Palynological research of the palaeoenvironment** was only done in the Dūkšteliai 1 site surroundings – samples, taken from the previously extinct lake Dūkštelis. The method was used as a part of a complex research made to examine the area: a relation among palynological, lithological and sedimentological data was taken into consideration. The research was done in collaboration with L. Gedminienė (Nature Research Centre, Vilnius, Lithuania), giving her the most credits for the work that was done.

A laminated core sequence was interpreted with respect to vegetation and climate change in the region and on the basis of a chronostratigraphical model and archaeological evidence recorded in the region[43]. 2 cm thick samples were taken for pollen analysis. In the 5 metres of the bottom sediments, five local pollen assemblage zones (LPAZ) were distinguished. The study has shown changes in nutrient status and ground water flow from the Last Glacial to Interglacial. As a consequence of the warming, the moss layer at the base of the depression marked the beginning of water table rise. LPAZ 1–3 deposits were non-rich in organic and calcareous gyttja, layers were very laminated and of mixed grain size. These features revealed unstable climatic conditions in the region. Pollen diagram has shown that *Betula* predominating tundra with thin soil cover existed at that time. The next LPAZ 4–5 have shown that later rich soils and warmer climatic conditions tolerating vegetation, *Corylus*, *Ulmus, Alnus, Quercus* started to dominate at the region.

The results of the complex investigations have suggested that the sedimentation in the lake started after the last glacial maximum. Therefore the date of the earliest possible lake shore settling was determined – organic material samples from the bottom of the lake were dated by AMS ^{14}C dating to

[43] Gedminienė, L., Rimkutė, G., Stančikaitė, M., 2014, Post-Glacial Environmental Changes and the Earliest Human Inhabitance of the Lake Dūkštelis Area, Eastern Lithuania / poster presentation in: Late Quaternary terrestrial process, sediments and history: from glacial to postglacial environments, Latvia, August 17–22.

12 469 ±162 cal BP (Diagram 1). As climatic conditions became stable, and the soil of the region got richer, the favorable conditions occurred allowing human occupation around the shores of the lake. Also a clear human activity impact on the flora spectrum was noticed somewhere in the stratigraphic level that could be of Atlantic–Subboreal period. This data was considered as possibly corresponding with the archaeological typology of the flint artefacts found in Dūkšteliai 1 site and showing the Neolithic–Bronze Age settling phase.

The palynological research was not possible to undergo in Pabartoniai 1 site environment as well as in other settlements on the river Neris banks due to the sandy nature of sedimentation and a very poor preservation of organic material.

3.13 **Study of ethnographic documentaries and publications** about 20th century eskimo, nunamiut, saami and other tribes whose cultures retain reindeer and other game hunting traditions was important to the understanding of the past nomadic cultures[44]. It was useful for interpreting the archaeological material left behind after the prehistoric sites were abandoned. Some cases recorded in ethnographic studies helped to elucidate on the specific use of some point types for a certain game in the Stone Age sites along the river Neris. Analysis of the hunter-gatherer anthropological data about settlement planning and situating[45] was useful for creating alternative interpretations on the prehistoric site settling based on archaeological data from various sites in the territory of concern. The depictions of the big game hunting strategies of northern nomadic and semi-nomadic peoples, and the importance of the river as a basic feature in creating them were significant as well[46]. It was studied with a prospective aim to

[44] Bockstoce, J. R., 1977, Eskimos of Northwest Alaska in the Early Nineteenth Century, ed. T. K. Penniman, University of Oxford, Pitt Rivers Museum, England, 139 p.
Lee, R. B., Daly, R. (eds.), 2012, The Cambridge Encyclopedia of Hunters and Gatherers, 538 p.

[45] Binford, L. R., 1978, Nunamiut Ethnoarchaeology, Studies in Archaeology, New York, Academic Press, 509 p.
Couchaux, D., 1980, Habitats nomades, Paris, 160 p.
Riches, D., 1982. Northern Nomadic Hunter-Gatherers. A Humanistic Approach. New York: Academic Press, 240 p.
Nelson, R. K., 1973, Hunters of the northern forest, Designs for survival among the alaskan Kutchin, University of Chicago Press, 303 p.
Binford, L. H., 1991, A Corporate Caribou Hunt. Documenting the Archaeology of Past Lifeways / In: Expedition: The magazine of the University of Pennsylvania, Vol. 33, p. 33–43.
Grøn, O., 2005, A Siberian perspective on the north European Hamburgian Culture: a study in applied hunter-gatherer ethnoarchaeology / In: Before Farming, Vol. 1, p. 35–64.

[46] Jackson, L. J., Thacker, P. T. (ed.), 1997, Caribou and Reindeer Hunters of the Northern Hemisphere, Avebury, 258 p.

understand the attraction of the big river Neris and the smaller creeks that led prehistoric people to settle their banks.

3.14 Limiting factors that made some of the crucial methods unavailable for this study were few, but very important. Unfortunately, most of the lithic collections were kept in two museums, meaning that an assemblage of one site was divided into two parts. In addition, these finds were mostly collected from the surface, thus, a significant part of the assemblage was left not unearthed or was later lost after the site was destroyed due to urbanization and other processes. Whereas some collections from lately excavated sites (Skaruliai 2, Neravai, Pasieniai 1) were unavailable for visual analysis as after the investigation they were not introduced to the institutions responsible for keeping the archaeological material. Respectively, lithics from Pabartoniai 1 and Dūkšteliai 1 sites excavated by the author of this study were available, but were still not suitable for some methods to be applied. While the sandstone blanks were collected and the refit of two cores was done, the intentions to refit flint blanks from Pabartoniai 1 site have shown that further excavations have to be done before an appropriate amount of assemblage is collected as only several blades fitted. Whereas the biggest part of the blades that were originally distributed in Dūkšteliai 1 site were missing (presumably because they were taken away and exploited by the later inhabitants of the area (see *'Dūkšteliai 1 site'*)).

Due to the complications of the find preservation listed above reffiting as well as *chaîne opératoire* reconstruction was not possible to undertake. However, these methods are seen as crucial for a complete analysis of the flint material use and tool making techniques applied in Final Palaeolithic and Early Mesolithic. After some more data is obtained from newly excavated sites, these methods will be undertaken as a next step of this research. Whilst this study is based on a preliminary technological analysis made after visual investigation of the flint debitage and of various features that might implicate the use of one or another flint knapping technology.

4. CHRONOLOGY

As it was already mentioned before, the precise chronology of the primeval settling of the river Neris basin was one of the most important issues in this research. For many years before it was based on flint tool typology and a comparative data from the radiocarbon dated sites in the nearby regions. The same methods for dating were used in the studies on Lithuanian and Latvian Final Palaeolithic archaeology published in the past few decades[47]. Swiderian culture was exclusively in concern as it was and still is probably mostly expressed in the Eastern Baltic Palaeolithic archaeological data. The main typological elements in the flint assemblage common to this archaeological culture were double-platform cores used for blade production and the tanged or leaf-form points with a flat retouch applied to the ventral side[48].

As the history of research on the Swiderian culture chronology up to mid 20th century has already been thoroughly described in archaeological literature[49], it will not be repeatedly written in this study. According to the latest chronology proposed by E. Šatavičius, Swiderian culture preliminary dates to 10 800–9 200 cal BC (having in mind two stages – an earlier and a later), whilst also a Post-Swiderian culture is distinguished in the Eastern–Northeastern Baltic region as a latest continuation of the flintknapping manner featured by Swiderians[50] – the flat retouched reversal side of the points. Presumably it dates to Early Mesolithic. Some archaeologists relate a so called *Post-Swiderian* period to:

1) the migration of human population northwards;
2) the probable transition (with the continuity of the manner to make flat

[47] Šatavičius, E., 1997, Vėlyvoji Svidrų kultūra / In: Kultūros paminklai, Vilnius, Vol. 4, p. 3–15.
Kozłowski, S. K., Gurba, J., Zaliznyak, L. L. (eds.), 1999, Tanged points cultures in Europe, Vol. 13, Lublin, 364 p.
Šatavičius, E., 2001, Vėlyvojo paleolito kultūros ir jų likimas ankstyvajame mezolite / Doctoral dissertation, Vilnius University, Vilnius, 135 p.
Ostrauskas, T., 2002, Apie vėlyvojo paleolito periodizaciją Lietuvoje. E. Šatavičiaus koncepcijos kritika / In: Lietuvos archeologija, Vol. 23, Vilnius, p. 239–246.
Šatavičius, E., 2005, Svidrų kultūra Lietuvoje / In: Lietuvos archeologija, Vilnius, Vol. 29, p. 133–170.
Girininkas, A., 2009, Lietuvos archeologija: Akmens amžius, Vilnius, Vol. 1, 328 p.
Zagorska, I., 2012, The ancient reindeer hunters in Latvia, Riga, 206 p.

[48] Sułgostowska, 1989, Prahistoria międzyrzecza Wisły, Niemna I Dniestru u schyłku plejstocenu, Panstwowe Wydawnictwo Naukowe, Warszawa, 254 p.
Зализняк, Л. Л., 1989, Охотники на северного оленя Украинского Полесья эпохи финальчого палеолита, Kiev, p. 74–75.
Ostrauskas, T., 1999, Kabelių 2-oji akmens amžiaus gyvenvietė / In: Lietuvos archeologija, Vol. 16, p. 57.

[49] Ostrauskas, T., 1999, Vėlyvasis paleolitas ir mezolitas Pietų Lietuvoje / In: Lietuvos archeologija, Vol. 16, p. 7–11.
Šatavičius, E., 2001, Vėlyvojo paleolito kultūros ir jų likimas ankstyvajame mezolite / Doctoral dissertation, Vilnius University, Vilnius, p. 93–95.
Šatavičius, E., 2005, Svidrų kultūra Lietuvoje / In: Lietuvos archeologija, Vilnius, Vol. 29, p. 133–135.
Girininkas, A., 2009, Lietuvos archeologija: Akmens amžius, Vilnius, Vol. 1, p. 57–62.

[50] Šatavičius, E., 2001, Vėlyvojo paleolito kultūros ir jų likimas ankstyvajame mezolite / Doctoral dissertation, Vilnius University, Vilnius, Fig. 60.

retouched tanged points) to a bit different Kunda and Butovo Mesolithic cultures[51];

3) the movement of reindeer populations more and more northwards due to climate change and retreat of tundra.

However, there are no exact AMS ^{14}C dates from the Swiderian sites in Central–Northern Lithuania and Latvia. Therefore their dating is by consensus believed to be somewhere in between the dates taken from Poland Swiderian sites[52] in the south (Allerød-Younger Dryas), and Kunda sites in the East–Northeastern Baltic region[53] (Preboreal), as it was believed that the latter might have evolved from Swiderian culture. Some ^{14}C dates of washed wood samples from Kabeliai 2 site (Southern Lithuania) was the only data related to Late Swiderian settling stage[54]. The river Neris basin is in the northern part of the region that was settled by Swiderian culture (not taking into account a few sites which were found even in Finnland[55]), and also on the border of the flinty and non-flinty territories. Thus it is important to reveal the Late Swiderian relation with the Early Mesolithic archaeological cultures. It could be assumed that in this area it was particularly expressed, and might have more to do with the flint sourcing issue than with the migration of reindeers or climate changes.

In this research the chronological extent reaches the Late Glacial period (starting from Allerød) at the earliest and Early Mesolithic (up to the beginning

[51] Zhilin, M., 1996, The Western Part of Russia in the Late Palaeolithic – Early Mesolithic / In: Earliest Settlement of Scandinavia. Acta Archaeologica Lundensia, No. 80, p.278–282.
Sulgostowska, Z., 1999, Final Palaeolithic Masovian cycle and Mesolithic Kunda Culture Relations / In: Tanged Points Cultures in Europe (eds. Kozłowski, S. K., Gurba, J., Zaliznyak, L. L.), Vol. 13, Lublin, p. 86–92.
Zaliznyak, L. L., 1999, Tanged points cultures in the western part of Eastern Europe / In: Tanged points cultures in Europe (eds. Kozłowski, S. K., Gurba, J., Zaliznyak, L. L.), Vol. 13, Lublin, p. 232–242.
Sinitsyna, G. V., Spiridonova, E. A., 2017, On the chronology and distribution of the swiderian culture in the upper Volga Lakeland / In: Stratum plus. Archaeology and Cultural Anthropology, p. 111–126.

[52] Rimantienė, R., 1984, Akmens amžius Lietuvoje, Vilnius, 343 p.
Gob, A., 1990, Chronologie du Mésolithique en Europe. Atlas des dates ^{14}C / Histoire de l'art et archeology, Université de Liège, Faculté de philosophie et lettres, 290 p.
Ostrauskas, T., 2002, Kundos kultūros tyrinėjimų problematika / In: Lietuvos archeologija, Vol. 23, p. 93–106.
Schild, R., 2014, Całowanie. A Final paleolithic and Early Mesolithic Site on an Island in the Ancient Vistula Channel, Instytut Archeologii i Etnologii PAN, 376 p.
And many more.

[53] Лозе, И., 1988, Поселения каменного века Лубанской низины. Мезолит, ранний и средний неолит, Riga, 209 p.
Янитс, К. Л., 1990, Кремневый инвентарь стоянок Кундской культуры, Doctoral dissertation, Moscow.
Zaliznyak, L. L., 1995, The Swiderian reindeer-hunters of Eastern Europe, Beiträge zur Ur- und Frühgeschichte Mitteleuropas 5, p. 41.
Ostrauskas, T., 1999, Kabelių 2-oji akmens amžiaus gyvenvietė / In: Lietuvos archeologija, Vol. 16, Vilnius, p. 31–66.
Ostrauskas, T., 1999, Vėlyvasis paleolitas ir mezolitas Pietų Lietuvoje / In: Lietuvos archeologija, Vol. 16, Vilnius, p. 11–12.
Kankaanpää, J., Rankama, T., 2009, The Sujala site in Utsjoki: Post-Swiderian in northern Lapland? / In: Mesolithic Horizons. Papers Presented at the Seventh International Conference on the Mesolithic in Europe, Belfast 2005 (*eds.* McCartan, S. B., Schulting, R., Warren, G., Woodman, P.), Vol. 1, p. 38–44.

[54] Ostrauskas, T., 1999, Kabelių 2-oji akmens amžiaus gyvenvietė / In: Lietuvos archeologija, Vol. 16, p. 56–57.

[55] Rankama, T., Kankaanpää, J., 2011, First evidence of eastern Preboreal pioneers in arctic Finland and Norway / In: Quartär, Vol. 58, p. 183–209.

of Boreal) as the latest probable primeval settling period, because some processes and technologies that had started in Final Palaeolithic later continued and were common in Early Mesolithic or even longer. In some cases later periods were also worth to be mentioned, when the issue had a direct relation with the first settling data (e.g. a repeatedly settled place on a river bank). The chronological interval was taken wide enough to encompass all the possible dates for the territory settling, as it was presumed that some different microregions were inhabited for the first time later than in Final Palaeolithic.

Most of the chronological scales introduced in the Eastern Baltic archaeology were taken into account[56], however, as a basis for this study a dating scale of Brommean, Ahrensburgian and Swiderian cultures as suggested by E. Šatavičius was chosen. It was based directly on the data from the Eastern Baltic area known until the beginning of 21st century and corresponded with chronological periodisation proposed by other authors[57] (Table 1).

One of the most distracting problems in discussing the Stone Age sites' chronology in river Neris basin and in Lithuanian territory in general, was the multiple settling of the same spot. This feature was common to the most of the sites in the area of focus and also in Dūkšteliai 1 and Pabartoniai 1 sites lately excavated by the author. However, at the same time it was also a very interesting point, as some interpretations on the behavior of later settlers of the same place could be made.

The basic questions to answer in this investigation were when, why and to what extent did the Final Palaeolithic people settle the territory, and what kind of peopling stages could be discerned. Whereas the Early Mesolithic settlers were taken into consideration with a purpose to see if they can be regarded as pioneers

[56] Яблонските-Римантене, Р., 1966, Периодизация мезолитических стоянок Литвы / In: У истоков древних культур (эпоха мезолита), Материалы и исследования по археологии СССР, Москва, Ленинград, p. 75–87.
Zaliznyak, L. L., 1995, The Swiderian reindeer-hunters of Eastern Europe, Beiträge zur Ur- und Frühgeschichte Mitteleuropas 5, 140 p.
Ostrauskas, T., 2001, Pietų Lietuvos apgyvendinimo chronologija / In: Akmens amžius Pietų Lietuvoje (geologijos, paleogeografijos ir archeologijos duomenimis), (eds. Baltrūnas, V. *et al.*), Vilnius, p. 210.
Eriksen, B. V., 2002, Reconsidering the geochronological framework of Lateglacial hunter–gatherer colonization of southern Scandinavia / In: p. 25–41.
Szymczak, K., 2000, Late glacial in Poland – cultural differentiation / In: L'Europe Centrale et septentrionale au tardiglaciaire. Confrontation des modèles régionaux de peuplement, Actes de la Table-ronde international de Nemours, 1997 (eds. Valentin, B., Bodu, P., Christensen, M.), p. 284.
Zvelebil, M., 2008, Innovating Hunter-Gatherers: The Mesolithic in the Baltic / In: Mesolithic Europe (*eds.* Bailey, G. and Spikins, P.), Cambridge, p. 23
Kozłowski, S. K., 2009, Thinking Mesolithic, Oxford, 380 p.
Girininkas, A., 2009, Lietuvos archeologija: Akmens amžius, Vilnius, Vol. 1, p. 77.

[57] Šatavičius, E., 2001, Vėlyvojo paleolito kultūros ir jų likimas ankstyvajame mezolite / Doctoral dissertation, Vilnius University, Vilnius, 135 p.
A personal consultation with dr. E. Šatavičius, May of 2017.

of the area in focus, or if they occupy exactly the same spots as their predecessors. In this research the chronology issues were discussed only after creating a database of 25 AMS ^{14}C dates obtained during the research of the lately excavated Pabartoniai 1 and Dūkšteliai 1 sites. It was optimistically presumed that it might be possible to find some material from the Final Palaeolithic period. As a result, a comparative data was expected to be supplied for the further investigation of the unfortunately undatable sites from river Neris basin with a rich Final Palaeolithic flint tool assemblage. However, the dating results received from Dūkšteliai 1 and Pabartoniai 1 archaeological sites reached the Early Mesolithic at the earliest. Therefore it became unclear if the dated material was really the earliest preserved in the sites, or if earlier archaeological material existed at all. Also some doubts on the reliability of the dating results were risen in the beginning of the investigation, but after gaining more than twenty different dates, the uncertainty was discarded.

Despite of not yielding Final Palaeolithic dates, the results of AMS ^{14}C dating from Pabartoniai 1 and Dūkšteliai 1 sites are of a great importance as they are without a doubt the earliest dates known in the western part of the river Neris basin. It became a future database for comparison with the datings obtained from other sites which are about to be investigated. The results have also led to some hypotheses of Swiderian culture dating that are being raised in this study, whilst in the upcoming years more datings are planned to be investigated from Dūkšteliai 1 as well as from Pabartoniai 1 site in order to revise and improve the exact chronology of their settling stages.

5. LATE GLACIAL-EARLY HOLOCENE ENVIRONMENT

5.1 **Geomorphology of the river Neris basin**

The landscape of the area of concern was shaped after the retreat of the Weichselian glacier in the Late Pleistocene. At least two stages of the glacier retreat stops could be related to this process, they had the most significant impact on the landscape geomorphology. During the Eastern-Lithuania phase the easternmost part of the area in focus – the river Neris section between

Vilnius town and its intersection with Vokė river – was already released from the ice (Map 1a and 1b). It became a very small part of a wide lateral Žeimena–Neris–Vokė–Merkys–Ančia ice-marginal streamway that had formed from the washed melting water and had ran from the northeast to the southwest, reaching even the present day North Sea[58].

The western part of the river Neris bed was formed soon after the glacier retreated from the territory northwestwards, in the Middle-Lithuania phase. The meltwaters cumulated close to the present Anykščiai town area, and soon after washed out through higher barriers into a large stream, running from northeast to southwest along moraine hills, shaped by the retreating glacier[59]. After some time the water washed in deeper and formed a riverbed – old lateral valley of proto Šventoji river – that was later linguistically dissociated into few sections and named as three separate hydronyms: river *Šventoji*, that flows into the lower reaches of the river *Neris*, which finally runs into *Neman* – the biggest river in Lithuania (Maps 1a and 1b).

The second terrace above the recent floodplain level of the river Neris has formed after some time, probably in the very end of the Pleistocene. Back then it was medium grained gravel and sand shore of the river and the third terrace had already arisen a few hundred metres or even a kilometre away from the shoreline. The smaller tributaries had also formed their riverbeds at that time and the landscape was later changing basically only by the growth of flora, but the relief has remained more or less unchanged until today. Now it has various types of orographic shapes: upper and lower river terraces, hills and plains. The river Neris basin contains numerous tributaries and lakes, mostly fed from the north–northeast, which have in some areas transformed into peat bogs throughout the Holocene.

The river Neris constantly flooded and left silty and very fine grained sand on the shores. Whilst eolian processes have also took part in the formation of the first postglacial light yellow-white fine grained silty sand layer, that covered

[58] Kavoliūtė, F., 2012, Lietuvos gamtinis pamatas, I dalis: Gelmės ir paviršius, Vilnius, Conspects of lectures, p. 32.
Basalykas, A., 1965, Lietuvos TSR fizinė geografija, Lietuvos TSR Mokslų akademija, Vol. 2, Vilnius.

[59] Kavoliūtė, F., 2012, Lietuvos gamtinis pamatas, I dalis: Gelmės ir paviršius, Vilnius, Conspects of lectures, p. 34.

most of the Stone Age sites along the river bank. These sandy banks with flint artefacts scattered on the surface were still visible in the mid 20th century, when there were no pine forests overgrown and building activity expanded.

Some of the Final Palaeolithic and Early Mesolithic sites (dating based on the tool typology) along the river Neris were found on the first terrace, while some were found on the second. Therefore, it might be presumed that both terraces had already existed at the time the first settlers came to camp on the river banks. According to the geological data, it could have been Younger Dryas or Preboreal period, as it is believed that the first terrace of the biggest river in Lithuania – Neman – has also formed at approximately that time[60]. Therefore, the people who had come to settle the Neris and Šventoji river terraces in Preboreal could have seen the river similar to what it is today (e.g. the river Neris now is 80–250 m wide).

Throughout the Holocene archaeological finds of the first founders of this land were covered mostly by aeolian postdepositional processes. The sand on the first and second terraces was blown and drifted to and fro forming some sand dunes, the artefacts have moved because of various bioturbations: animal and human trampling, plant root and small fauna nuzzling. The aeolian processes continued as the river banks were revisited again for a few times in Mesolithic, Neolithic and Bronze Age, therefore the yellow fine grained sand and light brown sand formed another layer in some areas of the territory of concern and the archaeological finds of different phases of settling have mixed.

At some time in the middle of the Holocene the vegetation of the second terrace of the rivers Neris and Šventoji took over the other processes (stratigraphically it can be seen as a darker color sand layer mixed with more organic material). It may be presumed that at that time a quite dense forest cover started to appear in some areas along the river. Meanwhile the territories where lakes were the more dominant landscape features than the rivers had also changed as many of the previously existed water bodies had disappeared, decreased, or turned into marshes.

[60] Baltrūnas, V. *et al.*, 2001, Akmens amžius Pietų Lietuvoje (geologijos, paleogeografijos ir archeologijos duomenimis), Vilnius, 260 p.

The present surface of the territory of focus is partly covered by forests, a lot of areas are overlaid by grey soil layer rich in humus. It probably correlates with the settlers of the past few millennia and the start of agricultural activity in the river Neris basin. The sandy areas along the rivers that were open fifty years ago are almost invisible now as new vegetation appeared and aeolian processes stopped. In the end of the previous century a thin dark grey forest soil layer has formed on top. Whilst the moraine hills of clay and sandy loam were mostly urbanized or used for agriculture. In present times they are covered by grass and a range of agricultural species of plants.

5.2 **Flora**

According to the Lithuanian palynological data analyzed in the past decades, the Late Glacial period and the beginning of the Holocene was characterized by the tundra landscape rich in *Betula* and small bushes, the climate should have been quite dry and cool. The *Pinus* and *Corylus* species are considered to appear a bit later, in Boreal period[61]. This information correlates with some data obtained from the recently excavated sites in the western part of the river Neris basin. The archaeobotany research done on the charcoal pieces taken from the archaeological features unearthed in Pabartoniai 1 and Dūkšteliai 1 sites have shown that *Pinus sylvestris* was used to make fire in both archaeological objects in some early phases of settling, whereas also *Salix* and *Corylus avelana* species were present in Mesolithic.

In the particular case of Dūkšteliai 1 site also the palynological research was done on the earliest sediments of the lake, that has formed in the Late Glacial. The results have shown that *Pinus* and *Betula* were the most common wood species, whilst some *Picea*, *Alnus*, *Ulmus* and *Corylus* were also growing in the lake surrounding area. Some pollens of bush/shrub species were identified to have existed at that time: *Salix*, *Juniperus* and *Ericaceae*. The most common species of grass were *Poaceae*, whilst also some *Artemisia* pollens and *Lycopodium* spores were identified (Diagram 1).

[61] Kabailienė, M., 2006, Gamtinės aplinkos raida Lietuvoje per 14 000 metų, Vilnius, p. 115.

The data described above has shown that the pollen analysis from Dūkšteliai Late Glacial lake relates to the basic Lithuanian pollen diversity diagram. However, the flora species found in Dūkšteliai 1 and Pabartoniai 1 archaeological sites show that they were most probably inhabited a bit later than the territory became convenient to be settled: the lack of *Betula* remains and the present *Corylus avelana* species might implicate that some people have camped in these two sites in the Early–Middle Holocene. The AMS ^{14}C dating corresponds with this data (Tables 4–5). Whereas the plant species spectrum common to the Final Palaeolithic (Younger Dryas–Early Preboreal period) was not recorded in the archaeobotanical data from the archaeological features of both sites. The reasoning for that could be:

a) the fact that these two sites were indeed settled only in Early Mesolithic;
b) the bad preservation of the archaeobotanical remains in the sandy sediments;
c) the very short term Final Palaeolithic–Early Mesolithic people camping in the sites, leaving almost no traces to be found and analyzed.

In the case of Dūkšteliai 1 site, the earliest plant species recorded was *Pinus silvestris* dating to 9150–8750 cal BC. Whereas fragments of *Salix* charcoals were dated to Middle Mesolithic, and should be ascribed to the environmental context of a later stage of site occupation. The hazelnut shell was not dated, yet presumably, it would most likely correspond with the Middle Mesolithic archaeological horizon and could implicate that the site was occupied during the warm season of the year, maybe autumn[62].

Taking in concern all the data described above, it can only be assumed that the western part of the river Neris basin was convenient enough to be inhabited in Younger Dryas–Preboreal. However, the archaeobotanical data was useful for only partly describing the flora in the environment that was common to this territory when the first settlers came. Still, pollen analysis have shown that the data fits the general Lithuanian pollen analysis diagram, therefore, e.g. Preboreal

[62] Eriksen, B. V., 1990, Cultural Change or Stability in Prehistoric Hunger-Gatherer Societies. A Case Study from the Late Palaeolithic – Early Mesolithic in Southwestern Germany / In: Contributions to the Mesolithic in Europe (eds. Vermeersch, P. M., Perr, P. V.), p. 199.

environment can be reconstructed on this basis[63]. It follows that the tundra type landscape with small bushes, various herbs–grass–shrubs, *Selaginella* species and *Betula nana* should have been growing on the sandy terraces of the river Neris and in the territory of its basin. There must have been no high trees which would cover the view for the first settlers in the Younger Dryas, but there should have been enough flora to hide from the wind and to make fire. Whereas on the transition from the Late Glacial period to Holocene, a forest cover with *Picea sp.* and *Betula* spieces was established. A bit later in Preboreal the climate was getting warmer, although the average temperature and the water level were relatively lower than that of today. The vegetation cover developed quite rapidly and light scarse birch forests became common to the landscape, presumably accompanied by the *Populus tremula* trees.

The climate got even warmer and milder in Boreal period, that relates to the Middle Mesolithic settling stage. As the water level and the average temperature were slowly rising, some broadleaf tree species were introduced. At that time *Corylus avelana* was supposed to have been a very common plant[64]. Correspondingly, the hazelnut shell found in Pabartoniai 1 site was dated to 7728–7481 cal BC (Table 5). Some pollen diagrams of sediments of this period show a higher amount of grasses, therefore some archaeologists believe it could mean that large intentively deforested areas started to appear in the landscape as the Mesolithic people could have burnt some parts of the forests[65]. This behaviour could also have had an impact of increasing the spread of *Corylus* species.

5.3 **Fauna**

The earliest faunal remains discovered in the area of concern are fragments of the skeletons of megafauna. According to the palaeontological data collected in the 19th–20th centuries, there were at least several places yielding some bones

[63] Kabailienė, M., 2001, Klimato kaita, ežerų lygis, augalijos ir dirvožemių raida / In: Akmens amžius Pietų Lietuvoje (geologijos, paleogeografijos ir archeologijos duomenimis), (eds. Baltrūnas, V., *et al.*), Vilnius, p. 132–135.
Juodagalvis, V., 2008, Mezolitas / In: Lietuvos istorija, A. Girininkas (ed.), Vilnius, Vol. 1, p. 61–63.
Stančikaitė, M., Kisielienė, D., Moe, D., Vaikutienė, G., 2008, Lateglacial and early Holocene environmental changes in northeastern Lithuania / In: Quaternary International, doi:10.1016/j.quaint.2008.10.009.

[64] Kabailienė, M., 1990, Lietuvos holocenas, Vilnius, 175 p.

[65] Daugnora, L., Girininkas, A., 2004, Rytų Pabaltijo bendruomenių gyvensena XI–II tūkst. pr. Kr., Vilnius, p. 20.

of *Mammuthus primigenius* species: in Užpaliai village near the river Šventoji[66], in the river Neris near Kaunas town and Elniakampiai village, in Gariūnai town surroundings, also four fragments of *dens incisivi* were discovered in Kazokiškės gravel mining place (dating to 46300±1100 BP, 38050±700 BP, 33740±380 BP and 30350±250 BP), and some pieces were unearthed in various places in Vilnius town[67]. According to the radiocarbon dates obtained, most of these finds should be ascribed to the Middle Weichselian period (74 000–24 000 BP). All of them were not found *in situ*, and should be basically related to the natural redepositioning due to the glacier movements as well as the flush of its melting water. Thus, these faunal remains could not be directly related to any of the archaeological sites and to human activity in general. Most probably, the same could be said about the antler of *Bos primigenius* found in Vepriai surroundings, at the outcrop of the river Šventoji, and a femur of *Coelodonta antiquitatis* species discovered in Vilnius. Assumedly, these species represent the period, which is not scientifically attributed to the human existence in the territory of focus.

On the basis of the zooarchaeological data obtained from various places in the Eastern Baltic and the neighbouring areas, it is presumed that after the Weichselian glacier had retreated the animal species which prefered cold weather should have spread into Lithuanian territory[68]. Assumedly, by the time the first people emerged in Final Palaeolithic, there was a quite wide variety of furry animals which could be hunted. Both, herd fauna (*Rangifer Tarandus*, *Equus ferus*, etc.) as well as forest predators living in small packs or individually (*Ursus arctor*, *Gulo gulo*, *Vulpes vulpes*, *Lynx lynx*, *Canis lupus*, *Alopex lagopus*, etc.) could have been present in the Late Glacial landscape at some cooler or warmer periods[69]. However, as it was recorded in a range of aboriginal

[66] Bitner-Wróblewska, A., Banytė-Rowell, R. (eds.), 2016, Inwentarz archeologiczny guberni kowieńskiej Michała Eustachego Brensztejna, Aestiorum Hereditas III, Part 1, Warszawa, p. 359.

[67] Gaigalas, A., Rimantienė, R., 2001, Medžiojamoji fauna akmens amžiuje / In: Akmens amžius Pietų Lietuvoje (geologijos, paleogeografijos ir archeologijos duomenimis), (*eds.* Baltrūnas, V.), Vilnius, p. 213–217.
Daugnora, L., 2004, Mamutai Lietuvoje / In: Lietuvos archeologija, Vol. 25, Vilnius, p. 9–16.

[68] Girininkas, A., 2009, Lietuvos archeologija: Akmens amžius, Vol. 1, Vilnius, p. 29–34.

[69] Sommer, R. S., Benecke, N., Lõugas, L., Nelle, O., Schmölcke, U., 2011, Holocene survival of the wild horse in Europe: a matter of open landscape? / In: Journal of Quaternary Science, Vol. 26(8), p. 805–812.

tribes, some of the species could have been avoided (e.g. fur-bearing animals and swans were not eaten by Evenkians and Ketians), thus, the big variety of animals could not be directly understood as a list of species hunted by prehistoric humans[70]. The reindeer species was and still is regarded as probably the most important to Final Palaeolithic hunter economy[71]. Small herbivorous animals (*Lepus arcticus*), various species of birds (*Lagopus lagopus*, etc.) and fish should have also been a part of the ecosystem which was found by humans[72]. The western part of the river Neris was only a small territory of the Eastern Baltic region, thus the Late Glacial faunal variety should have been the same as in the rest of the area, but might have differed a bit if compared to coastal territories.

The very beginning of Holocene was much milder, thus some new species started to dominate in this territory (*Cervus elaphus*, *Sus scrofa*, *Castor fiber*, *Alces alces*, *Lutra lutra*, *Martes martes*, *Cygnus olor*, etc.), yet presumably they were already present here earlier[73]. A number of fish species were common as well. At the same time one of the most important event in faunal history is highlighted by archaeologists: the retreat of some arctic animal species, reindeers in particular, which had presumably happened at some point in Preboreal. However, the question when these animals have abandoned Lithuanian territory and migrated further northwards still remains unclarified. Some archaeologists believe it was the transition from Pleistocene to Holocene (Younger Dryas/Preboreal), whilst others suggest that reindeers could have sometimes seasonally migrated and could have been hunted here also in Early

---

Benecke, N., 2004, Faunal succession in the lowlands of northern Central Europe at the Pleistocene – Holocene transition / In: Hunters in a changing world. Environment and Archaeology of the Pleistocene – Holocene Transition (ca. 11000-9000 B.C.) in Northern Central Europe (*eds.* Terberger, T., Eriksen, B. V.), Internationale Archäologie – Arbeitsgemeinschaft, Tagung, Symposium, Kongress 5, p. 43–51.

[70] Zaliznyak, L., 1997, Mesolithic Forest Hunters in Ukrainian Polessye, BAR International Series, book 659, England, p. 76.

[71] Кларк, Дж.Г., 1953, Доисторическая Европа. Экономический очерк, 280 p.
Sturdy, D., 1975, Some reindeer economies in prehistoric Europe / In: Palaeoeconomy, Cambridge, p. 55–95.
Зализняк, Л. Л., 1989, Охотники на северного оленя Украинского Полесья эпохи финального палеолита, Киев, "Наукова думка", 176 p.
Enloe, J. G., David, F., 1997, Rangifer Herd Behavior: Seasonality of Hunting in the Magdalenian of the Paris Basin / In: Caribou and Reindeer Hunters of the Northern Hemisphere (*eds*. Jackson, L. J., Thacker, P. T.), Chapter 4, p. 52–65.

[72] Sommer, R., Benecke, N., 2005, Late-Pleistocene and early Holocene history of the canid fauna of Europe (Canidae) / In: Mammalian Biology – Zeitschrift für Säugetierkunde, Vol. 70, Iss. 4, p. 227–241.
Girininkas, A., 2009, Lietuvos archeologija: Akmens amžius, Vol. 1, Vilnius, p. 63.

[73] Sulgostowska, Z., 2003, Mesolithic Colonisation of South-Eastern Subbalticum / In: Mesolithic on the Move, Papres presented at the Sixth International Conference on the Mesolithic in Europe, Stockholm, 2000, (ed. Larsson, L.), p. 47–51.
Daugnora, L., Girininkas, A., 2004, Rytų Pabaltijo bendruomenių gyvensena XI–II tūkst. pr. Kr., Vilnius, p. 238, 240, 246.
Girininkas, A., 2009, Lietuvos archeologija: Akmens amžius, Vol. 1, Vilnius, p. 32–35.

Preboreal[74] or even up until Boreal period[75]. The faunal remains of *Rangifer tarandus*, unfortunately, are not numerous in the Eastern Baltic archaeological data due to very poor conditions of bone and antler preservation. These several dozens of artefacts were mostly stray finds found accidentally and have had no broader archaeological context[76]. Nevertheless, most of the reindeer specimens were dated by AMS ^{14}C dating, and the results have shown that the latest dating of this species in Eastern Baltic territory could be related to Preboreal period (approximately 9970 BP)[77]. However, it could still be presumed that the most recent dated fragment was not the last reindeer existed in the territory – it was the most recent specimen found by archaeologists. A theory should be taken into account that reindeers, as a species of migratory animals, might have been seasonally emerging in Lithuanian territory in three different stages:

1) when this territory was their northern area of migration distance, visited in summer;
2) when this territory was an area between their northern and southern points of migration distance, crossed twice per year;
3) when this territory was their southern spot of migration distance, visited in wintertime.

The migration journey of a reindeer herd can sometimes take nearly a thousand kilometres[78]. Thus, even if they were already retreated as far as to the present Estonian territory, there might still be a little possibility that they could have occasionally visited Lithuanian territory in colder winters. These kinds of 'events' were and still are common in Canada, where thousands of reindeers still emerge in some areas once per 30 years and people have the opportunity to watch their migration. In addition, the disappearance and re-colonization of the reindeer population was and still is recorded in many regions, e.g. the last

[74] Daugnora, L., Girininkas, A., 2005, Šiaurės elnių keliai ir jų paplitimas Lietuvoje vėlyvajame paleolite / In: Lietuvos archeologija, Vol. 29, Vilnius, p. 119.

[75] Kozłowski, S. K., 1989, Mesolithic in Poland: A New Approach, Warsaw, p. 24.

[76] Daugnora, L., Girininkas, A., 2005, Šiaurės elnių keliai ir jų paplitimas Lietuvoje vėlyvajame paleolite / In: Lietuvos archeologija, Vol. 29, Vilnius, p. 119–132. Girininkas, A., *et al*., 2016, Lyngby type artefacts of Lithuania in the context of the Stone Age in Europe: multidisciplinary study / In: Archeologija un etnogrāfija, Riga, Vol. 29, p. 13–30.

[77] Ukkonen, P., Lõugas, L., Zagorska, I., Lukševica, L., Lukševics, E., Daugnora, L., Jungner, H., 2006, History of the reindeer (Rangifer tarandus) in the eastern Baltic region and its implications for the origin and immigration routes of the recent northern European wild reindeer populations / In: Boreas, Vol. 35, Iss. 2, p. 222–230.

[78] Heard, D. C., 1997, Causes of Barren-ground Caribou Migrations and Implications to Hunters / In: Caribou and Reindeer Hunters of the Northern Hemisphere (eds. Jackson, L. J., Thacker, P. T.), Chapter 2, p. 27–31.

'gap' of reindeer abundance in Finnland ecosystem was in 1900–1950s[79]. Therefore it cannot be determined when exactly the *Rangifer* species left river Neris basin and were not ever hunted there again, but according to the radiocarbon dating it could be assumed that in 9 400–9 300 cal BC they have crossed this territory, as a Lyngby type artefact dating to 9253–9459 cal BC (Poz-15118) was discovered in Poland[80]. However, due to the later warming of the climate, a denser forest cover might have become less preferable for big reindeer herds. Thus, if any reindeers emerged in Lithuanian territory in Middle Preboreal or later, assumedly it could have been *Rangifer tarandus fennicus* species, which could have persisted in that environment. Moreover, the retreat or decline of the reindeer population in Preboreal could have been also a result of increased numbers of wolves and other predators, not only of the changing climate.

The reindeer species is known to be quite flexible and well adapting to cooler or warmer environment. The same can be said about the moose species (*Alces alces*). It was already present in Late Glacial environment and was known to have been hunted by Final Palaeolithic groups of people. Sometimes, at some areas they were even taken into discussion as a more important prey for particular groups of people than reindeers, e.g. Brommean people were seen as moose hunters[81]. The significance of this animal species in Mesolithic era is indisputable[82]. The reindeers and moose coexisted in the Younger Dryas–Preboreal period, thus, most probably were equally hunted by applying different hunting strategies. The moose could have been hunted in small numbers, yet throughout all the year, whilst reindeers might have been a prey chased only several times per year, but by slaughtering more individuals at once. Despite the big amounts of meat obtained during the hunts of these two

[79] The IUCN Red List of Threatened Species, 2016, International Union for Conservation of Nature and Natural Resources (ISSN 2307-8235).

[80] Girininkas, A., *et al*., 2016, Lyngby type artefacts of Lithuania in the context of the Stone Age in Europe: multidisciplinary study / In: Archeologija un etnogrāfija, Riga, Vol. 29, p. 13–30.

[81] Larsson, L., 2009, After the cold: Mammal finds, hunting and cultural affinities during the Preboreal / In: Humans, Environment and Chronology of the Late Glacial of the north European Plain, Proceedings of Workshop 14 (Commission XXXII) of the 15th U.I.S.P.P. Congress, Lisbon, September 2006, (Street, M., Barton, N., Terberger, T. (eds.)), p. 131–140.

[82] Chaix, L., 2009, Mesolithic elk (Alces alces L.) from Zamostje 2 (Russia) / In: Mesolithic Horizons. Papers Presented at the Seventh International Conference on the Mesolithic in Europe, Belfast 2005 (*eds.* McCartan, S. B., Schulting, R., Warren, G., Woodman, P.), Vol. 1, p. 190–197.

species, the small game chasing, fish and birds hunting, picking of eggs and plants was most likely the basis of living for the first inhabitants.

Prehistoric sites in the area of focus yielded only some fragments of faunal remains. Burnt bones that were considered to belong to eaten animals were discovered in Kernavė 3, Pabartoniai 1 and Dūkšteliai 1 sites, in Early-Middle Mesolithic cultural layers and were related to some archaeological features. Unfortunately, the discovered pieces were too small to determine the exact species and for applying AMS ^{14}C dating technology. Several fragments presumably were of the long bones. Only one artefact was not fragmented – a calcinated sharp tooth that could be of a non determined species of fish[83] (of *Esox* genus?) or of some small animal (Fig. 147). It was found at Pabartoniai 1 site, in the deepest layer related to the earliest horizon of site settling. This specimen might be related to fishing activity, however, further examination is needed before any interpretations are given.

7. EARLIEST ARCHAEOLOGICAL SITES

In this chapter, most of the Final Palaeolithic–Early Mesolithic sites discovered in the river Neris basin will be discussed. The flint finds collections from these sites were thoroughly studied in the National Museum of Lithuania, Museum of Kernavė Archaeological Site and in Kaunas Vytautas the Great War Museum (see '*Database*' in CD). A big part of the archaeological data was lithic assemblages collected from the surface during the repeatedly organized surveys in the river Neris valley and along some of its tributaries. Also the archaeological data from the recently excavated sites was examined, paying more attention to Dūkšteliai 1 and Pabartoniai 1 sites that were investigated by the author in 2013–2016.

Most of the sites were discovered in the 30s or earlier and then were revisited for many times in the upcoming decades. Whilst some collections were not related to any discoverer and probably were a result of the surveys organized by the people who worked in the museums.

[83] Ritchie, K. C., personal consultation in 2016.

Aliejūnai site

The site was discovered in 2016 during a survey expedition organized by R. Vengalis[84]. A double-platform core and some flint debitage were found in the area where a natural system of little streams and lakes formed the upper reaches of Airupė river, that is a tributary of the river Neris (Map 43 (Z)). Nowadays the place is on a northwestern bank of the lake Aliejūnai, whereas back in the Stone Age it was actually a southwestern corner of a much wider lake. At that point a small stream was running out of it and flew into river Airupė. These particular patterns of nature most probably attracted some group of people. The artefact leads to an implication that some stone knapping activity took place at the site and the semi regular blades were produced to make some flint implements. The site might be dated to Final Palaeolithic or Early Mesolithic, yet also a later dating is possible. A larger scale investigation should be undertaken in order to determine its exact location and chronology of the site settling.

Bartoniai site

Bartoniai site was situated on the left bank of the river Neris, on the first terrace above the floodplain around 600 m away from the nowadays river flow. The artefacts were collected in a 300x200 m width sandy mound surrounded by swamp[85]. Throughout the years it was at least partly destroyed by sand and gravel mining activity in the late 20th century[86]. Yet, it could only be presumed that it was located close to a small tributary Barsukinė, though its natural flow was changed due to the agriculture purposes (Maps 25 (D) and 26 (E)).

At the survey time the mound was not very high and its surface was undulating, covered with small bushes. Whilst today it is almost impossible to localize the exact place of the site as the previously existed mound could have been dug out or submerged under the water. Back in the 30s the location of the

[84] Vengalis, R., 2017, Kernavės apylinkių (Elektrėnų, Širvintų r. ir Vilniaus r. sav.) archeologinių žvalgymų 2016 metais ataskaita, excavation report, Museum of Kernavė archaeological site, Kernavė.

[85] Rimantienė, R., 1974, Akmens amžiaus paminklai / In: Lietuvos TSR archeologijos atlasas. Akmens ir žalvario amžiaus paminklai, Vol. I, LTSR Mokslų akademijos istorijos institutas, Vilnius, p. 23, depiction No. 27.
Rimantienė, R., (no date), Bartoniai, manuscript in the National Museum of Lithuania, Vilnius.

[86] Respublikinis žemėtvarkos projektavimo institutas, 1988, Lietuvos TSR Jonavos rajono gamtos, istorijos ir kultūros paminklų katalogas, 2nd edition, Vilnius, Centre of Cultural Heritage, file No. 66.

site was defined as being ‘exactly on the opposite side of the river from the perspective of Pabartoniai site’. However, according to R. Rimantienė notes, the distance between the river and its second terrace at that point had to be 1,2 km. Therefore it seems that the site was probably around 1,1–1,2 km farther eastwards than Pabartoniai 1 site as the definition does not fit the geographic parameters of the river bank at Pabartoniai location (the distance between the river and the terrace at that point is almost twice as short).

On the Bartoniai mound there were two separate places yielding archaeological finds. Flint artefacts as well as blue obsidian and quartzite-like flint finds were collected from the surface. Flint artefacts were of different intensity of patina: white and light blue colored finds were mixed with the ones with no or almost no patina. There were also finds with yellowish or reddish color patina. The quality of flint material was rather good than poor. A number of decortication flakes were present. Some artefacts were affected by high temperature.

Statistically the blade fragments were mostly of the proximal end or medial part, whilst the distal parts of the blades were probably used for tool producing. Some blanks were retouched a bit or utilized. There is not much archaeological data for the reconstruction of flint knapping techniques used in Bartoniai site. However, one probable double-platform core residue, also a knapped piece of flint and some core reparation flakes were found in the site. These finds show that the flint was knapped and the tools were produced in situ. Whilst according to the negatives of the blades, mostly soft unipolar flint knapping technique was used in the site and only some blanks were prepared from double-platform cores. Some flint pieces were broken.

The tool assemblage (Fig. 1) contains a proximal part of a Swiderian point, some burins made of various size flakes, as well as some scrapers of different kind and a few tools of non determined function. The number of identified tools has changed after the examination of the flint finds assemblage:

one retouched flake was previously misinterpreted as a point[87], whilst some additional previously unidentified tools – few burins and some undetermined function implements – were recognized.

Presumably the Bartoniai site has been visited for at least few times in the past and most probably the visits were short-term. The pioneers of this place could have been Swiderian people who camped in Bartoniai and hunted. Only one regular retouched blade fragment could be rather related to Mesolithic stage of settling as the regular blade producing is believed to have been not inherent to Final Palaeolithic settlers. The hide working tools kit show that the hunting prey was probably treated in situ. The campsite was not massive, it can be assumed that only few people had spend some time in the site.

Bielazariškės site

The site was discovered in 2014 by R. Vengalis[88] (Map 33 (L)). It was located on the right bank of the river Neris, on its first terrace, around 40–50 m to the east from the river, approximately 6 m above the water level. During a survey expedition several intensively patinated flint finds were collected. They were preliminary dated to Final Palaeolithic–Mesolithic. However, no further interpretation could be done until a larger scale investigation was undertaken.

Čiobiškis site

The site was discovered in 2010 by Darius Stončius, a famous biologist[89]. A scraper made of flake was found on the right bank of the river Neris, around 1 km away from its intersection with the river Musė, about 100 m from water flow (Map 30 (I)). In 2016 during a survey expedition organized by R. Vengalis[90] also several intensively patinated flint finds were collected from the same area. The discovered blade typical for Final Palaeolithic–Early Mesolithic implicated that somewhere on the second terrace of the river a prehistoric site should have existed.

[87] Rimantienė, R., (no date), Bartoniai, manuscript in the National Museum of Lithuania, Vilnius.

[88] Vengalis, R., 2015, Žvalgomieji tyrimai Kernavės apylinkėse / In: Archaeologiniai tyrinėjimai Lietuvoje 2014 metais, Vilnius, p. 105–117.

[89] Darius Stončius collection of archaeological finds (2010–2012), National Museum of Lithuania, Vilnius.

[90] Vengalis, R., 2017, Kernavės apylinkių žvalgymai / In: Archeologiniai tyrinėjimai Lietuvoje 2016 metais, Vilnius, p. 458–465.

The find should be preliminary dated to Final Palaeolithic–Early Mesolithic. However, no further interpretation could be done until a larger scale investigation was undertaken and the exact location of the site was determined. It could only be presumed that as there were wide sands to the north–northeast from the place where a flint blade was found, that particular area could have been a natural feature that attracted the first visitors. Thus maybe one or even several Final Palaeolithic or Mesolithic sites could be located in that sandy area around 500–700 m away from the river Neris flow, on the wide second terrace (Map 30 (I)). These presumptions could be made on the basis of similar distribution of Salininkai sites, especially in relation to the specific character of the landscape – the intersection of two rivers.

Drąseikiai site

Stone Age site at Drąseikiai village was discovered by K. Jablonskis during his surveys along the river Neris in early 30s. Unfortunately, the area was started to be exploited for gravel and sand mining only two years after publishing the Atlas of Lithuanian archaeological sites in 1974, yet there is almost no possibility, that Drąseikiai Stone age site was not destroyed as around 2 m of sediment was dug off from the surface. On the basis of the old maps and site location depictions[91], it could be presumed that the site was on the right bank of the river Neris, in an elongated sandy area on the second terrace of the river, in between two tributaries – Girdažė and Margupis (Map 24 (C)). The site was also titled as *Stavidvaris* after a small village situated nearby, therefore some archaeologists considered Drąseikiai and Stavidvaris to be two separate sites[92]. Yet after R. Rimantienė, the place was exactly the same and it was only named by two different names. The sandy place yielding flint artefacts and pottery fragments was around 630 m to the northwest from the river Neris flow, about 6–7 m above its water level. At that point valley of the river was the widest, reaching about 2 km width.

[91] Rimantienė, R., 1974, Akmens amžiaus paminklai / In: Lietuvos TSR archeologijos atlasas. Akmens ir žalvario amžiaus paminklai, Vol. I, LTSR Mokslų akademijos istorijos institutas, Vilnius, p. 30, depiction No. 51.
Rimantienė, R., (no date), Drąseikiai, manuscript in the National Museum of Lithuania, Vilnius.

[92] Girininkas, A., 2009, Lietuvos archeologija: Akmens amžius, Vol. 1, Vilnius, p. 48.

The second Stone Age site in Drąseikiai town territory was also found by K. Jablonskis. According to the descriptions, it had to be situated to the north from the first Drąseikiai site, in a sandy area of around 700 m length[93]. However, due to the lack of related geographic features mentioned and some discrepancies between the maps of 1931 and the descriptions made in early 30s, the exact location of the site was not determined.

The village was visited for many times in 30s and 40s, therefore a big assemblage of lithic artefacts was collected. It was later studied by several archaeologists and published as a typical Swiderian collection of artefacts[94]. However, there were three-to-five separate places (Drąseikiai 1, 1a, 2, 2a and 2b) localized in Drąseikiai sands where the lithics were collected. At first they were probably kept separately, yet unfortunately later some of the assemblages were mixed. Therefore in this study it was decided to investigate all the collection as belonging to one site having in mind that it was a scattered type of site, containing several occupation zones. Moreover, the lithics could be divided into few separate assemblages on the basis of typological dating and be ascribed to different stages of settling. The multiple occupation was also apparent as there were artefacts with some traces of re-use in later times. Thus, only the finds that were considered to be of the earliest dating were taken into account.

Lithic assemblage (discarding the finds typical to Neolithic or Bronze Age) contained a lot of flint debitage, mostly flakes and a bit less blades. Some blanks were quite wide and long, implicating that the cores were big. While by the means of the quantity, the collection of cores had also stood out from the assemblages found in other sites in the lower reaches of the river Neris, as few tens of different form cores were present. The flint material was of a good quality, at least of a better quality than the local nodules were. Therefore

[93] Rimantienė, R., 1974, Akmens amžiaus paminklai / In: Lietuvos TSR archeologijos atlasas. Akmens ir žalvario amžiaus paminklai, Vol. I, LTSR Mokslų akademijos istorijos institutas, Vilnius, p. 30, depiction No. 51.
Rimantienė, R., (no date), Drąseikiai, manuscript in the National Museum of Lithuania, Vilnius.

[94] Римантене, 1971, Палеолит и мезолит Литвы, Вильнюс, p. 99, 106–109, 112–113, 156, Fig. 95, 96.
Rimantienė, R., 1984, Akmens amžius Lietuvoje, Vilnius, p. 61, 63, Fig. 33:1–4, 33:8, 33:15, 33:18, 40:14, 41:10.
Girininkas, A., 2009, Lietuvos archeologija: Akmens amžius, Vol. 1, Vilnius, p. 48, 55, 59, 61, 73, 82–83.
Taute, W., 1968, Die Stielspitzen-Gruppen im Nördlichen Mitteleuropa. Ein Beitrag zur Kenntnis der späten Altsteinzeit / In: Fundamenta, A-5, Böhlau, Verlag, Köln, Graz, p. 158 and Taf. 157.
Šatavičius, E., 2001, Vėlyvojo paleolito kultūros ir jų likimas ankstyvajame mezolite / Doctoral dissertation, Vilnius University, Vilnius, p. 89, 117; Fig. 19:3, 33:1–4.

assumedly it was brought from somewhere else and then worked at the site. Moreover, the first settlers had most probably brought flint nodules instead of prepared cores, as there were plenty of decortication flakes. Thus it would be reasonable to think that bringing big pieces of flint was not difficult: either the flint resources were not far away, or the people could have known some easy ways to get it (e.g. exchange it). However, also some cores of low quality material with charcoal inclusions were present, as well as several completely used cores of only few centimetres length. These finds might implicate another (most probably later) stage of site settling, or, less likely, a lack of flint material with which the first settlers had to face after a longer stay.

At least several different types of flint could be identified, e. g. one of them was flint with small white dots. Assumedly, the lithic debitage could be at least partly refitted or divided into few separate assemblages on the basis of the flint type, yet it was still presumed that the first inhabitants used more than one nodule of flint (bearing in mind that all the visitors who had come to camp at the site in Final Palaeolithic should be considered as 'first inhabitants', because there is no way to date which group of people had come earlier).

The blades were of different regularity. After analyzing the negatives of knapping it became apparent that both – unipolar and double-platform – cores were used for blank production. The same could be said after studying the cores and their fragments. However, comparatively much more blades were produced from unipolar cores. While it was not clear if the cores were used by changing their direction and form, no presumptions could have been made on the quantity of unipolar cores used and the actual extent of the unipolar knapping technique application on the first stage of site settling. Whilst on some of the blanks a microburin blade division technique was apparent. The latter finds would be typologically ascribed to Middle–Late Mesolithic. Mostly a demi-soft knapping was applied, while blade pressure technique was less used. Also some multidirectional cores of non determined form were found in Drąseikiai site collection. They were of considerable dating and interpretation, because they could have been formed as one or two-directional in the

beginning of their use. Many blades produced from a very good quality flint cores were not used, therefore a presumption could be made that the first settlers of the site did not experience a lack of flint material.

Part of the lithic assemblage was intensively patinated, whilst also finds without patina were present. Few lithics were with reddish patina due to postdepositional chemical processes that might have affected their surface. Some flint artefacts, including cores, had contact with high temperature, therefore it could be presumed that some of the flintknapping activity took place by a fireplace.

Drąseikiai site had also yielded non-flint rock artefacts – a flake of a very good quality quartzite and an point made of siliceaus rock that could be petrologically described as quartzite-like flint. These finds could seem to be unimportant, yet some knapped non-flint rocks were also found at Pabartoniai 1 site around 9–10 km away to the NE, therefore it would be reasonable to note this fact even if no further interpretations could yet be done.

The collection of flint implements was rich in variety. Most of the points were of Late Swiderian type – they were made of semi-regular blades produced from double-platform cores, were of a leaf form and had a tang retouched with flat retouch in ventral side, as well as the edges retouched with marginal retouch from the dorsal side (Fig. 2:1–4, 6–7, 9, 13, 17). One of the points was with a tighten tang (Fig. 2:8) and would remind a typical Swiderian type of arrow. Whilst also a big part of the assemblage was typologically ascribed to Ahrensburgian tradition, as their tangs were formed only by retouching the sides with marginal retouch from the dorsal side (Fig. 2:10, 12, 14–16, 18–20, 26–27). However, most of the blanks used for these tools production were basically the same as of Swiderian points, therefore it would not be clear if the division of the point assemblage into two different collections on the basis of the tang retouch would be correct. All the points of the leaf form, nothwithstanding the way their tang was formed, could belong to the same Final Palaeolithic or Early Mesolithic group. However, some of the points also stood out as much shorter and made of irregular blades or even flakes (Fig. 2:12, 26–27). These

implements could implicate the existence of a separate group of people who used Ahrensburgian technique for arrow production. Therefore on the basis of typology, they might be ascribed to the earliest visitors of Drąseikiai site.

However, the variety of points found at the site encompassed not only Late Swiderian and Ahrensburgian types, also some unique finds were present. One of those was a leaf form point with all the perimeter retouched with marginal retouch from dorsal side (Fig. 2:21). This implement was similar to the Mesolithic points common in various cultures found in European plain, e. g. some of alike points were present in the assemblages of Kudlayevka culture (Liubotyn 3, Krinicja 2A, etc.)[95]. Moreover, the point found in Drąseikiai was made of a different flint material that, as it was mentioned above, could be petrologically defined as quartzite-like. Therefore this artefact stood out by all means: the form, the material it was made of, and the technique used to produce it. As it was made of a rather regular blade, produced from a unipolar core, its relation to Mesolithic tradition would be reasonable.

Another exception in the assemblage of flint points was a point with a one-sided tang (Fig. 2:28). It was made of a semi-regular blade produced from a double-platform core and formed using a marginal retouch from dorsal side. The uniqueness of this implement formation was also in the blank orientation – the tip was formen on the proximal end of the blade. R. Rimantienė has interpreted this implement on the basis of its proportions, therefore she ascribed it to Mesolithic lancet type points, which, according to the researcher, were common to most Mesolithic sites[96]. However, these kind of implements were not characteristic to all the Mesolithic cultures, yet they were not rare as well. Very similar points were found in the so called Pesotchnorova Mesolithic culture[97], the usual assemblage of which sometimes also contained tall and narrow trapezes, just like the one found at Drąseikiai site (however, this

[95] Зализняк, Л. Л., 1991, Население Полесья в мезолите, Киев, "Наукова думка", p. 21, Fig. 6.
Зализняк, Л. Л., 2005, Финальний палеоліт і мезоліт континентальної України. Культурний поділ та періодизація / In: Кам'яна доба України, Вип. 8, Київ, Шлях, p. 71, Fig. 28:52, 54, 56.

[96] Rimantienė, R., 1984, Akmens amžius Lietuvoje, Vilnius, p. 76, 78, Fig. 40:14.

[97] Зализняк, Л. Л., 1991, Население Полесья в мезолите, Киев, "Наукова думка", p. 47, Fig. 18.
Зализняк, Л. Л., 2005, Финальний палеоліт і мезоліт континентальної України. Культурний поділ та періодизація / In: Кам'яна доба України, Вип. 8, Київ, Шлях, p. 59, Fig. 19.

trapeze was an object of discussion and was even misinterpreted as a broken point of a Magdalenian type[98]) (Fig. 11:37). Points with one-sided tang were also common to Krasnoselye culture, that was technologically closely related to the Ahrensburgian point production[99]. Yet they were probably most often found in the Post-Ahrensburgian Yenevo culture, in the area to the east from Lithuanian territory[100]. Yet, tall trapezes and one-sided tanged points were also common in Western Europe as well as in Scandinavia (e. g. Ertebølle culture)[101]. Wherever the origin of these finds could be determined, it would still be most likely that they belonged to the Mesolithic period.

There was one artefact which was interpreted as a not completely formed point (Fig. 2:23). It was a piece of a non regular blade with a proximal end detached and a half-retouched tang from the ventral side. A presumption was made that this point might have been thrown away in the middle of the production process and for some reason was not finished. The technique that was used to form it looked similar to the one of Late Swiderian culture.

The variety of points found in Drąseikiai site revealed that the place was visited for many times by Final Palaeolithic as well as by Mesolithic groups of people (remains of later settling not taken into account). Certainly there were communities who knew Late Swiderian and Ahrensburgian technique of tool making, whilst the implements dating to Mesolithic could be related to the cultures that had existed to the South-Southeast-East from Lithuania.

More than 120 scrapers of different types were collected in the sands of Drąseikiai (Fig. 3–6). Around 1/3 of them were made of blades produced from double-platform and unipolar cores, whilst the biggest part of scrapers were formed on flakes. Only few scrapers could have been interpreted as having been handled. The variety of scrapers was so big that probably all examples of types

[98] Ostrauskas, T., 2002, Apie vėlyvojo paleolito periodizaciją Lietuvoje. E. Šatavičiaus koncepcijos kritika / In: Lietuvos archeologija, Vol. 23, Vilnius, p. 244.

[99] Зализняк, Л. Л., 2005, Финальний палеоліт і мезоліт континентальної України. Культурний поділ та періодизація / In: Кам'яна доба України, Вип. 8, Київ, Шлях, p. 48, Fig. 13:4–7.

[100] Galimova, M., 2006, Final Palaeolithic–Early Mesolithic Cultures With Trapezia in the Volga and Dnieper Basins: the Question of Origin / In: Archaeologia Baltica, Vol. 7, Vilnius, p. 138, Fig. 2.

[101] Kozłowski, S. K., 1975, Cultural Differentiation of Europe from 10th to 5th Millennium B.C. (Zróżnicowanie kulturowe Europy w X-V tysiącleciach P.N.E.), Warsaw, p. 180–181, 217, Fig. 2.

were present. Therefore it was difficult to analyze the collection. Analogues could be found in other sites along the river Neris, e.g. alike combined scrapers-burins were discovered at Pabartoniai 1 site (Fig. 60:1; 19), scrapers formed on crested blades were likewise common at Saleninkai sites (Fig. 75:6, 78:15–17), while the usage of decortication flakes for scraper making was also determined at Kernavė 3 site (Fig. 45–46, 52). The scrapers had varied in size and width as well. Thus, no particular destinction of scraper types or groups would be reasonable while talking about Drąseikiai assemblage, only one possible characteristic could be applied on all the scrapers – more or less they were all made without a big scrutiny and a particular attention to the form. It seems that most likely these implements were made in a fast way, simply using the most suitable blanks. The quantity of these tools might implicate that a lot of hide treatment work had been done at the site, however, it was probably done by some different groups of site visitors in different time. It might be presumed that these tools were produced in situ and were not brought from somewhere else (the same could be said about the rest of the implements in the assemblage).

The big variety of tool types was apparent in the rest of the lithic collection: burins as well as implements of particular or non-defined function (Fig. 8–11). Some of the blanks were with burin blow negatives or were broken in the way a sharp angle was formed. Assumedly some of these finds could have been used as burins, though no microwear analysis was done to approve this assumption. Many burins were re-produced taking an implement of some other function as a blank.

Moreover, the main character that was described above – a rather little attention to the tool production – was inherent for the biggest part of the assemblage. Therefore an assumption could be made that the site was mainly visited for short-term camping purposes for several times or/and by several groups of people. The analogues of flint tools in other sites along the river Neris (whether they were situated few or tens of kilometres away from Drąseikiai) showed that the Final Palaeolithic–Early Mesolithic assemblage was mixed and could be ascribed to several different, yet at some cases

technologically related groups of settlers. Thus, Drąseikiai sands could have been a strategically important place where people of different communities might have gathered for hunting, meeting, communication, social as well as intellectual exchange and other purposes.

The two tributaries probably were not a main point of attraction as both of them were situated at least few hundred metres away from the site, rather it was a sandy area convenient because of a good field of vision and the big river Neris, which could have been very important for hunt. However, the site was situated relatively closer to Margupis tributary, thus it could have been used as a source of drinking water when the site was occupied.

Draučiai site

The site was discovered in 2014 by R. Vengalis[102] (Map 42 (V)). During a survey expedition several intensively patinated flint finds were collected around 4,5 km away to the northeast from the river Neris, near a previously existed lake. The site was situated on the western part of a large sandy area of nearly 6 km^2. The flint finds were preliminary dated to Final Palaeolithic–Mesolithic. However, no further interpretation could be done until a larger scale investigation was undertaken.

Dūkšteliai 1 site

The site was discovered in 2012 when a survey expedition was organized in the surroundings of previously existed Dūkštelis lake[103]. The site was excavated in the upcoming years up until 2016. In total an area of 100 m^2 yielding Early Mesolithic and Neolithic–Bronze Age finds and prehistoric features was investigated.

The site was situated on a sandy prominence on the southeastern shore of a previously existed lake (Map 41 (U), Fig. 115), around 7 m higher than an

[102] Vengalis, R., 2015, Žvalgomieji tyrimai Kernavės apylinkėse / In: Archaeologiniai tyrinėjimai Lietuvoje 2014 metais, Vilnius, p. 105–117.

[103] Rimkutė, G., 2013, Skauduliškių–Dūkštelio ežerų mikroregiono žvalgomieji tyrimai / In: Archeologiniai tyrinėjimai Lietuvoje 2012 metais, Vilnius, p. 587–590.
Rimkutė, G., 2014, Dūkštelių akmens amžiaus gyvenvietės 1 kasinėjimai / In: Archeologiniai tyrinėjimai Lietuvoje 2013 metais, Vilnius, p. 40–43.
Gudaitienė, G., 2015, Dūkštelių akmens amžiaus gyvenvietė 1 / In: Archeologiniai tyrinėjimai Lietuvoje 2014 metais, Vilnius, p. 28–32.
Gudaitienė, G., 2016, Dūkštelių senovės gyvenvietė / In: Archeologiniai tyrinėjimai Lietuvoje 2015 metais, Vilnius, p. 22–26.
Gudaitienė, G., 2017, Dūkštelių senovės gyvenvietė / In: Archeologiniai tyrinėjimai Lietuvoje 2016 metais, Vilnius, p. 24–26.

implied water level. Somewhere in the area the upper reaches of the river Dūkšta (which is a tributary of the river Neris) should have originated. However, throughout the recent hundred years human activity had significantly changed the landscape, therefore the exact reconstruction of water body system of this area was not possible. Yet on the basis of hydronims it could be presumed that the riverhead of Dūkšta was somewhere in the previously existed lake Dūkštelis or in its residue that exists up until today.

As a small scale survey has been done in this microregion, it became apparent that the shoreline of the previously existed lake was also inhabited in Neolithic or Bronze Age[104]. One site dating to this period was exactly in front of Dūkšteliai 1 site, on the other side of the lake to the NW, whilst another one was 390 m to the South, around 8 m above the presumed lake water level. The area where Dūkšteliai 1 site was located was one of only few sandy places around the lake, whereas the rest of the area was basically covered by glacial clay- and sandy loam sediments. This natural feature could have been a point of attraction for prehistoric people, as the shore of the lake there was not steep and the access to the water body could have been very convenient.

Lake sedimentation was investigated for several purposes: a) to reconstruct the probable depth of the lake in various points; b) to determine a preliminary dating of the lake formation; c) to reconstruct the prehistoric environment that surrounded the lake when the first visitors came to settle its shores. Sediment samples were studied in collaboration with L. Gedminienė (Nature Research Centre, Vilnius). According to the results of palynological research, *Pinus* and *Betula* species dominated in the area when the lake has formed around 12 469 (±162) cal BP, and after around 1 500 years, when the Early Mesolithic settlers have visited its shore, also some *Ulmus*, *Picea* and *Corylus* started to appear (see *'Palynological research of the palaeoenvironment'* and Diagram 1). The lake was around 13 m depth at its deepest point, however, the shore slope was rising rather gradually, being steeper only at some places.

[104] Rimkutė, G., 2013, Skauduliškių–Dūkštelio ežerų mikroregiono žvalgomieji tyrimai / In: Archeologiniai tyrinėjimai Lietuvoje 2012 metais, Vilnius, p. 587–590.
Gudaitienė, G., 2015, Dūkštelių akmens amžiaus gyvenvietė 1 / In: Archeologiniai tyrinėjimai Lietuvoje 2014 metais, Vilnius, p. 28–32.

It is impossible to determine when the names of the river Dūkšta and the lake Dūkštelis were applied and started to be used as hydronims, but according to etimological data it could relate to Latvian word *duksts* (mean. *swamp*, *marsh*) and Lithuanian word *dūksinas* (mean. *dirty*, *muddy*)[105]. Presumably, these hydronims could date to the times when the lake had already started to become a swamp and people could not reach the water anymore. Yet, according to palynological data, it happened much later, most probably in AD.

While a palynological research of Dūkštelis 1 site sediments was not possible due to the bad organic material preservation in sand/gravel/silt, an investigation on chemical and physical composition of disturbed and less disturbed soil was undertaken (see section *'Geochemical and geophysical analysis of the archaeological features and their surroundings'*, Table 2 and 3, Fig. 159). The results have shown that the site area was not significantly polluted by later anthropogenic activity, therefore chemical analysis of the samples taken from prehistoric features could be investigated. Thus, the AMS ^{14}C dating results should have also been reliable, even if the dated prehistoric features were unearthed rather high, only some tens of centimetres deep from the surface. Stratigraphy of the site consisted of three to four layers: the earliest horizon of the finds was related to white fine to coarse sand layer, on top of which was a yellow small grained sand and greyish yellow sand layers, which were covered by a thin previous humus soil layer and a technogenic soil cover on top (Fig. 117). The ground soil at Dūkšteliai 1 site appeared to be not homogeneous, even if it looked like during the excavation. This characteristic has lead to a presumption that the colors of prehistoric features could and should differ if their function and/or dating was different. Also, it became clear that the same color of two archaeological features should not be interpreted as a unifying character of the features of one archaeological horizon.

Another important result of the geochemical investigation was that osteological material – burnt bones – did not dissolve in the sediment through time. Therefore fortunately the amount of these finds (few tens of finds) has

[105] Vanagas, A., 1981, Lietuvių hidronimų etimologinis žodynas, Vilnius, p. 409 p.

most probably represented the actual quantity of burnt bone left by prehistoric people.

Archaeological finds discovered at Dūkšteliai site during the excavation were mostly lithics. Some pottery fragments were present as well, but they were not taken into concern as having no relation with the remains of the first settlement. One burnt hazelnut shell was discovered at the site. It was not only interpreted as a remain of prehistoric people food, but also as an indicator of the environment type, that was already reconstructed by examining the sediments of previously existed lake Dūkštelis.

Lithic assemblage collected at the site in 100 m^2 was not big (Fig. 12–14). However, typologically it represented at least to stages of settling – Early Mesolithic (finds implicating the use of blade technology) and Neolithic–Bronze Age (triangle point, implements made of flakes). The latter was more apparent because more tools of this period were found. On the opposite, Early Mesolithic could only be identified from a little part of the assemblage, mostly fragmented blades produced from unipolar cores, and few implements. During the first two seasons of investigation this character of the flint collection has risen some uncertainties in considering the site dating, until the AMS ^{14}C datings done on charcoal samples had approved that the site was indeed settled in Early Mesolithic (Table 4). The finds of both horizons were mixed and moved in the ground due to bioturbations. Stratigraphically they could not be discerned and were ascribed to the same one layer of white fine to coarse sand. However, in smaller or bigger amounts lithics were present in all the stratigraphical layers.

Lithic assemblage which was typologically related to Early Mesolithic settling stage were only few. Unfortunatelly, no classical points were discovered, yet several finds could be interpreted as fragments of leaf-form points made of semi-regular blades produced from unipolar cores (Fig. 12:1–2). Presumably, a tall and narrow trapeze could be also ascribed to the earliest settlers' tool kit (Fig. 23:3). This implement was a bit similar to the one found at Drąseikiai site (Fig. 11:37) and could be dated either to Early Mesolithic or

to Middle Mesolithic, as according to AMS ^{14}C datings, the site was visited twice in Mesolithic period (Table 4).

Another flint implement that could have belonged to the first visitors, was a scraper made of a crested blade (Fig. 12:10). The early dating of this artefact was suggested because its scraping edge was formed on the proximal end of the blank. This character of scraper production was quite common in Final Palaeolithic and Early Mesolithic.

The cores found at the site were almost completely used and would implicate a lack of flint material. However, some fragments of blades discovered were products of a much bigger core (Fig. 12:6, 8, 12, 14, 18). These finds became a proof that the Early Mesolithic assemblage was formed having at least one core (or nodule) of good quality flint material. However, the latter could probably not be found somewhere around in Dūkštelis lake surroundings, it was most probably brought from the South. To do that people certainly had to reach the river Neris or even go few tens of kilometres more southwards. Dūkšteliai 1 site was situated around 15 km to the northeast from the river Neris. In order to reach it by going along the Dūkšta river valley, people had to make a trip of nearly 30 km, that would last at least 7 hours.

However, it was apparent that many blanks, especially blades as well as big flakes and decortication flakes were lacking in the lithic collection. Yet at the same time the Neolithic archaeological data – typical flint finds – became hard to identify after AMS ^{14}C dating was done on samples from the prehistoric features unearthed at the site. None of them was dated to Neolithic or Bronze Age, therefore no Neolithic settlement remains could be identified at the site. Moreover, there were several artefacts with a later re-retouch found. The only assumption that could be applied on this archaeological data was that Neolithic people did not settle the site, but used it as a flint material source. Thus, most of the high quality blanks and tools produced by their predecessors in Mesolithic were reused and remade. The Neolithic sites found around the previously existed lake were actually settled, whilst the sandy southeastern bank was visited only occasionally. This hypothesis would explain the lack of

Early Mesolithic finds, which could make up to ~80% of the assemblage that had previously existed.

The archaeological features unearthed at the site were only few. To compare, an investigated area of the same size in Pabartoniai has yielded more than 30 stains, whilst Dūkšteliai site – only 7–8 stains. Three of them had stood out: a Fireplace No. 1, Features No. 1 and 5 (Fig. 116–119, 159). They were dated by AMS ^{14}C dating (Table 4).

The archaeological feature No. 1 was unearthed in 35 cm depth. It was a 180–200 cm long semicircle form stain of greyish sand with a concentration of lithic finds, mostly flakes (Fig. 116). At the deepest point of the stain a cumulation of 6 stone pebbles was recorded. The stones were not affected by fire. The feature was 50 cm deep. After examining some charcoal samples taken from its centre under a microscope, fragments of different tree parts were identified: some pieces of branches, also little fragments (up to 1 cm) of a trunk. Yet the species of the wood was not determined. At first the feature was interpreted as a prehistoric remains of a hut, as the greyish sand implicated some sediment mixing with organic material (mostly carbonized wood), but the ground and the lithic finds were not affected by high temperature. However, the feature was dated by AMS ^{14}C dating to Viking period and to the 1st millennium cal BC (Table 4). As no artefacts of similar dating were discovered within the limits of the feature stain or around it, the interpretation was revised: it should most probably be considered as a tree windfall. Thus, the concentration of the lithic artefacts was only a deceptive impression as the finds and some stone pebbles had most likely been moved upwards by this bioturbation and then felt down as a cummulation.

Another archaeological feature was a 140–150 cm wide and 60–65 cm deep stain with some stone pebbles next to it, that was interpreted as a Fireplace No. 1 (Fig. 117, 160). Its function was determined on the basis of several characteristics:

a) a more or less round form,

b) a greyish color sand mixed with ashes and very small charcoal pieces (up to 2–3 mm) filling,

3) its size being too small for a hut, but quite large for fire making,

4) the orange and white color sediment of the bottom, presumably due to the high temperature that affected it.

It seemed most likely that the fireplace was recessed into the ground for at least few tens of centimetres. After investigating the sediment samples taken from its centre, charcoals of *Pinus sylvestris* were identified (see section *'Archaeobotanical analysis'*). The filling of a fireplace was somehow layered from a micro-stratigraphically point of view. The bottom ground has not only changed its color to orange or white, but also was a bit hardened. Presumably, the fire was made in the fireplace repeatedly for many times and a rather high temperature (of more than 300–400^{o}C) was reached or was kept burning for a long time. In the limits of the fireplace stain and especially on its Southwestern side some stone pebbles of more or less 10 cm size were recorded. Part of them were found in the very bottom of the stain. Whilst one stone was a quite big boulder (20x16x12 cm) with one flat side. It was found on the Western side of the fireplace. The stones were not affected by fire, therefore they were interpreted as some sort of artefacts presumably used not as parts of the fireplace construction, rather, they were utilized for some activity related with water or food heating.

Some finds discovered in the filling of the fireplace were affected by fire, also several flint tools were present. In the very centre of the feature a dark grey (almost black) color lense was unearthed and a burnt flint flake was found in it. Around 1 m away to the southeast a very small piece of red ochre was discovered. As this find was unique, it was not clear if it was not a natural piece of ferruginous rock. Yet, if it was an artefact, it could be assigned to the same archaeological horizon as the fireplace. The same dating could be presumed for two little pieces of burnt bones, one found to the southeast, and another – to the north from the fireplace. These two artefacts should relate to the activity that took place around the fireplace.

AMS ^{14}C dating (charcoal samples investigated in Laboratory of Kiel University and in the Center for Physical Sciences and Technology in Vilnius) has revealed that this prehistoric feature was formed by Early Mesolithic people (Table 4) and was the earliest remains of a settlement found at the site.

The third prehistoric feature unearthed and investigated at Dūkšteliai 1 site was Feature No. 5 (Fig. 118–119). It was a brown sand stain with some greyish sand lenses. The form of the stain was undefined, its size reached around 250x200 cm and it was 47 cm deep. According to the geochemical analysis, it was a separate feature from the smaller stain No. 8b to the south (Fig. 159) even though their color was more or less the same and there was a sort of connecting coloring of the sediment in between these two features.

Feature No. 5 was discovered during the survey expedition in 2012, when a test pit of 1 m^2 was dug in that place. It was investigated down to the level when softer greyish-brown sand was reached and, after an advise given by E. Šatavičius, was not dug further because the sediment was anthropogenically affected. Therefore later it could have been fully unearthed during a larger scale excavation. After two charcoal pieces were dated by AMS ^{14}C method, it became apparent that the feature was of Middle Mesolithic (Table 4) and was not an object of the same archaeological horizon as the Fireplace No. 1.

Feature No. 5 contained not only flint artefacts (e.g. blades produced from unipolar core), but some tens of burnt bone fragments as well, especially in its northwestern part (also in the area beyond its limits) (Fig. 159). These finds were interpreted as pieces of animal bones. Geochemical analysis applied on the sediment samples taken from the feature and around it had revealed that no osteological material had dissolved through time and that the fragments found in it represented the actual quantity of bone remains left by prehistoric people. Thus, the amount of these finds was rather small and they were considered as remains of one individual.

Some stone pebbles and small boulders found within the limits of the feature No. 5 stain (Fig. 118, 159) could be related to it and be interpreted as part of the prehistoric construction. Also several knapped sandstone flakes

were discovered around the feature No. 5. However, as they did not refit no further interpretation could be given.

The size, form and archaeological data of this feature have lead to a presumption that it could have been a prehistoric hut, suitable as a shelter for at least two people. It was recessed a little bit into the ground, whilst the stone pebbles in the northern part of it might have been used for the hut construction as holders, and could relatively mark the entrance (where the sort of 'appendix' of the stain was recorded) (Fig. 159). At the very bottom that was reached in the southwestern part of the feature No. 5 two unburnt stone boulders were discovered. Presumably they were put there to hold something inside the hut.

After analyzing some charcoal peaces taken from the stain centre *Salix* species was identified. As the wood of willow is barely used for fuel, it was presumed that most likely some of its branches or poles were used for hut construction.

The burnt bones might indicate some food preparation or eating activity that took place in the hut or at its entrance. One stone pebble found around 1,5 m away to the west from the feature No. 5 (around 2 m to the west from the assumed entrance of the hut) stood out as one side of it was polished (Fig. 120). The polishing technique applied on non flint rock artefacts in Mesolithic rather than in Neolithic was and still is a question of concern[106]. However, this artefact could be related to the feature No. 5 and the same Middle Mesolithic archaeological horizon until no features dated to Neolithic or later period were determined at Dūkšteliai 1 site. It would then be considered as one of the artefacts found in Lithuania approving the hypotheses that the use of polishing technique pre-dated Neolithic. Yet it could have been not polished, but used for polishing or grinding instead. However, as the polished surface of the stone boulder had no recess and the edges of the artefact were not (wether purposedly or not) polished, most probably it was not a polisher or a grinding stone.

To sum up, after analyzing three features at the site, two overwhelming

[106] Rimkutė, G., 2012, Netitnaginių uolienų apdirbio technologijos ir dirbinių gamyba finaliniame paleolite-mezolite Lietuvoje / In: Archaeologia Lituana, Vol. 13, Vilnius.

archaeological horizons were identified – remains of Early Mesolithic fireplace and, 8 m away, a concentration of Middle Mesolithic settlement features, one of which was considered to have been a hut. The typological investigation of the flint artefacts had also revealed a Neolithic–Bronze Age archaeological data that was not related to a settlement stage, but to a site visiting period instead.

As a significant lack in the Mesolithic lithic assemblage was apparent at Dūkšteliai 1 site, the analysis of the distribution of flint artefacts was only partly reasonable. Apart from the concentration of burnt bone fragments recorded close to the feature No. 5, a high number of flint tools was detected in between the fireplace No. 1 and feature No. 1 (Fig. 159). It could be reservedly considered as an activity zone, yet a big part of the tools found in that area should be typologically dated to Neolithic–Bronze Age. Probably the only flint finds concentration that would be worth to be analyzed was recorded within the limits of the feature No. 5 (the hut) and around it, where flakes, a completely used core and fragmented blades produced from unipolar cores were present. That area should be considered as an activity zone of Middle Mesolithic, yet still with part of the assemblage lacking.

The Early and Mid Mesolithic flint material (blanks and cores) could have been taken and brought to the Neolithic sites situated somewhere in the previously existed lake surroundings. Yet there is still an opportunity to find at least part of the assemblage (either re-used or not) few tens of metres to the NW, closer to the previously existed lake shore, where there is a high probability of finding Mesolithic as well as Neolithic settlement remains.

Dvaronys site

The archaeological data about Dvaronys (previously titled as ‘Anykščiai’) site was kept in Kaunas Vytautas the Great War Museum and was never published or studied. Primarily because the exact location of the site was not known. It was discovered in 1936 by K. Šimonis, who had given the artefacts to the State Archaeological Committee. A little box with lithic assemblage was kept in the museum with only one label that could hint to the place where it was

collected: the site was ‘in the sands close to Puntukas’, – the second biggest geological boulder in Lithuania. It was and still is situated on the left bank of the river Šventoji, on its first terrace above the floodplain, 75 m to the northeast from the tributary called Verseka, in Dvaronys village. A small depiction of its location was included into the Atlas of archaeological sites[107], however, no one had ever searched for the site since its discovery.

Presumably, Dvaronys site should have been somewhere in the area where the first terrace rises and meets the second terrace (Map 39 (S)), because if it was situated very close to the tributary, this reference point would have probably be mentioned in the site location depiction. The area was sandy, so the finds were most likely collected from the surface.

The flow of the river Šventoji was previously 100–200 m to the northwest and had much more meanders, therefore it could be presumed that the intersection with a small tributary Verseka was also a bit further to the N. It could be presumed that the small river was one of the main natural features of attraction for the first visitors. However, Dvaronys site had probably stood out from other sites because of the natural landmark – the erratic boulder, protruding in the sandy river valley. As the boulder had been brought to the valley of Šventoji river by the Weichselian glacier, assumedly it was exposed and should have been noticed by prehistoric people.

The lithic assemblage contained only nine artefacts, all implements. Most probably the smaller pieces – flakes, blades, core fragments, etc. – were not collected deliberately or were refused to be kept in the museum. Nevertheless, the collection was informative enough (Fig. 15). A leaf-form point with a flat retouch on the ventral side of the tang has lead to an interpretation that the site was most probably inhabited in Final Palaeolithic or the first half of Mesolithic and should be ascribed to Late Swiderian culture. The flint knapping technique could also be reconstructed after the examination of finds: double-platform and unipolar cores were used to produce long blades out of which implements were

[107] Rimantienė, R., 1974, Akmens amžiaus paminklai / In: Lietuvos TSR archeologijos atlasas. Akmens ir žalvario amžiaus paminklai, Vol. 1, LTSR Mokslų akademijos istorijos institutas, Vilnius, p. 21, depiction No. 9.

made. As the assemblage consisted of various types of implements usually found in other sites – a scraper, a point, a burin, etc., – it was assumed that the site was visited for hunting and prey treatment purposes.

Unfortunately, no interpretation on a site settling stages or longitudiness could be made because most probably the nine finds did not represent the actual quantity of lithic assemblage that could be found and investigated at Dvaronys site. Yet the site was still very important as one of only few Late Swiderian sites discovered in the northern part of Lithuania. The flint material quality was very good and the usage of quite big cores was apparent, therefore it could be presumed that the material (maybe a core instead of a raw nodule) was brought to the site from the South, where the nearest flint sources could be found at least 90–100 km away (or around 140–150 km if going along the river valleys).

Eiguliai 1 site

A Stone Age site in Eiguliai was known to have existed many years ago. It was one of the first sites discovered in the lower reaches of the river Neris. Primarily because it was situated very close to Kaunas town (and nowadays as the town has expanded, it falls into its territory) and therefore was visited by archaeologists living in Kaunas. The first stone artefact from Eiguliai ever mentioned in the literature was a stone axe known to have been discovered somewhen in the late 19th century[108]. Later the site was most probably visited for many times by P. Tarasenka who had collected the first bunch of lithics in the sandy slope in Eiguliai village[109] and by J. Puzinas[110]. Yet the most credits for the site discovery and investigation went to K. Jablonskis and later to his daughter R. Rimantienė[111]. The flint finds assemblage collected by them was one of the biggest if taken into comparisson with other sites along the river. Later it became one of the main collections representing Swiderian culture and

[108] Покровский Ф. В., 1899, Археологическая карта Ковенской губернии, Вильно.

[109] Tarasenka, P. 1928, Lietuvos archeologijos medžiaga, Kaunas, p. 127.

[110] Puzinas, J., 1937, Eigulių II km. kapinyno tyrinėjimų ataskaita, 1935, 1937 m., Copy of the report No. 424 kept in Kauno State Museum, Archive of the Intitute of Lithuanian History, file No. 1131.

[111] Jablonskis, K., Survey diaries, Archive of the Lithuanian National Museum, Department of Archaeology, Vilnius.
K. Jablonskis collection in the National Museum of Lithuania, Vilnius.
Rimantienė, R., (no date), Eiguliai, manuscript in the National Museum of Lithuania, Vilnius.
Jablonskytė-Rimantienė, R., 1954, Eigulių (Kaunas) akmens amžiaus stovyklos tyrinėjimai 1952-3 m., Kaunas, Archive of the Institute of Lithuanan History, file No. 62, Vilnius.

was analyzed in Lithuanian archaeological works as well as was known for the scientists from other countries[112] (Maps 6, 12, 15, 20). However, it is worth to mention that back in the 70s only 29% of the lithic assemblage was actually published, whilst only 17 redrawn implements were presented in the literature addressed to Western European readers[113].

The place where Eiguliai 1 site was located was destroyed during a highway bridge building in 1964, five years after the archaeological data found there was published[114].

The site was situated on the left bank of the river Neris, at its lower reaches, around 5 km to the northeast from its intersection with the biggest river in Lithuania – Neman. The site was divided into four separate places yielding flint artefacts: Eiguliai 1A, 1B, 1C and 1D. It was a sandy area around 300–400 m away from the river flow which, at that point, is 170 m wide, and where the valley of the river gets narrow. Around 500 m to the north from the site there was a small tributary called Žiobrikis (Map 22 (A)). The biggest part of the site was on the second terrace, around 10–12 m above the water level, whilst only Eiguliai 1C find place was a bit higher, on the edge of the third terrace. All the four find places were few hundred metres away from each other. In this study all of them were investigated separately, but were considered as parts of one archaeological complex. The finds from Eiguliai 1 site were kept in National Museum of Lithuania, in Vilnius, and in Kaunas Vytautas the Great War Museum.

Eiguliai 1A find place was situated on the left bank of the river Neris, around 400–410 m away to the east from its flow, on the second terrace above the floodplain. It was in a partly eroded sandy slope, therefore the flint finds

[112] Taute, W., 1968, Die Stielspitzen-Gruppen im Nördlichen Mitteleuropa. Ein Beitrag zur Kenntnis der späten Altsteinzeit / In: Fundamenta, A-5, Böhlau, Verlag, Köln, Graz, fig. 156.
Римантене, Р. К., 1971, Палеолит и мезолит Литвы, Вильнюс, p. 17, 38–45.
Rimantienė, R., 1984, Akmens amžius Lietuvoje, Vilnius, p. 27–32.
Šatavičius, E., 2001, Vėlyvojo paleolito kultūros ir jų likimas ankstyvajame mezolite / Doctoral dissertation, Vilnius University, Vilnius, p. 108–110.
Кольцов, Л. В., Жилин, М. Г., 2008, Финальный палеолит лесной зоны Европы (культурное своеобразие и адаптация), p. 66–67.
Girininkas, A., 2009, Lietuvos archeologija: Akmens amžius, Vol. 1, Vilnius, p. 60.

[113] Taute, W., 1968, Die Stielspitzen-Gruppen im Nördlichen Mitteleuropa. Ein Beitrag zur Kenntnis der späten Altsteinzeit / In: Fundamenta, A-5, Böhlau, Verlag, Köln, Graz, p. 157, fig. 156.

[114] Яблонските-Римантене, Р., 1959, Стоянки каменного века в Эйгуляй / In: Вопросы этнической истории народов Прибалтики, Москва, p. 11–31.

were exposed on the surface. Part of it was destroyed before its investigation was iniciated. At first, several thousands of flint finds were collected from the surface and then a small scale excavation was undertaken in 1948. A few prehistoric features were unearthed during the investigation which were presumably ascribed to the Stone Age. Unfortunatelly, the excavations had revealed that the biggest part of the site was already destroyed.

The collection of lithics was previously studied for several times. After analyzing the two collections of Eiguliai 1 site kept separately in two museums it was noticed that the finds that were collected from the surface were much more intensively patinated than those which were recorded during the excavation of the site. Therefore no interpretations made on the basis of patina color were considered as reliable.

Flint material used at Eiguliai site was of a very good quality and the amount of lithics implicates that it was not lacking. As the site was situated only few tens of kilometres from the flint sources in Southern part of Lithuania, it could be presumed that the material was easily brought to the site. The amount of cores and their fragments left by prehistoric people implicated that the flint knapping took place at the site for many times, presumably it was done by some different people. The assemblage contained mostly unburnt material, lithics affected by fire were not numerous. Therefore it could be presumed that the flint knapping activity zones were not situated close to the fireplaces, if there had existed any. According to R. Rimantienė notes[115], in the Southern part of Eiguliai 1A find place a small area yielding lots of flint flakes was detected. Assumedly, these were the remains of a flint knapping activity zone No. 1. Another cumulation of lithics was unearthed in the northeastern part of the trench. It was also interpreted as a flint knapping zone by R. Rimantienė herself. It could be titled as a flint knapping zone No. 2.

Flint cores varied in size and form, there were unipolar as well as double-platform and amorphous cores used to produce blades and flakes. They were far not completely used, thus an assumption could be made that there was no

[115] Rimantienė, R., (no date), Eiguliai, manuscript in the National Museum of Lithuania, Vilnius.

need to save flint material. Mostly semi-soft flint knapping technique was used for semi-regular blade production, which is usually considered as a typical Final Palaeolithic technique. Numerous decortication flakes showed that the flint material was brought to the site as nodules, and the cores were produced at the site.

Collection of flint implements was typologically ascribed to Final Palaeolithic. The points were mostly long and narrow, made of blades (Fig. 16). Flat retouch from the ventral side was used for thinning the proximal end of the blanks and to form a tang. Some of the points were also retouched on sides with a marginal retouch from the dorsal side. These finds were ascribed to the Late Swiderian culture. Also one blade with a retouched proximal end from both – ventral as well as dorsal – sides was discovered (Fig. 16:1). It could have been a blank taken for a point production. However, the tip of it was broken, and the implement seemed to be not completely formed. This interpretation was also approved by M. Zhilin[116].

One point stood out from a Swiderian assemblage, because its proximal end (a bulb) was only partly flattened with a retouch (Fig. 16:4). Whilst another one was of a rhombus/leaf form and had a tang retouched from both sides (Fig. 16:7). Typologically it was interpreted as a Swiderian type point.

The scrapers found at the site were mostly made of non-regular or semi-regular blades and flakes, with working edge formed on the distal end of the blank (Fig. 18–19). Only few tools were had a wide scraping edge. As it was seen after a visual study of the edges of large flakes, some of them were also utilized for scraping. This manner of blank use could show that some quick decisions were made when a scraping work had to be done, and would implicate either a short-term visit of the first inhabitants or that they did not put a lot of effort into tool production. However, some of the scrapers seemed to have been handled as utilization marks or retouch could be seen on their proximal part. Moreover, some of them are of a very similar width, thus an assumption could be made that they could have been changed and put into the same one handle.

[116] Personal consultation with Hab. Dr M. Zhilin, 2015.

One scraper made from a non-regular blade was with marks of a later retouch and use (Fig. 19:6). Presumably, it was produced in Final Palaeolihic and then was found and utilized for scraping again in Late Mesolithic or Neolithic.

Eiguliai 1A site also yielded several burins (Fig. 17), which were on the most part two-directional and had a cutting edge corrections done at least for few times. They were produced mainly from semi-regular blades, but flakes were also taken to form the cutting angle. Some blanks with retouched and utilized margins could have been used as knives. Whilst part of the tool kit was of non-determined function. One flake with its edges intensively utilized by hitting a hard material was previously interpreted as a fire striking tool. However, this interpretation, suggested by K. Jablonskis years ago, could not be approved if the find was considered as dating to Stone Age, because no marcasite, pyrith or similar ferruginous rock that could have been used for striking with a flint piece was ever to be found in Lithuanian territory. Therefore the use of a flint striker before the iron was introduced was impossible. Moreover, some finds with similar utilization could be identified in the lithic assemblage collected at Eiguliai 1 site, thus it should not be seen as an outstanding artefacts.

An artefact which undoubtedly stood out in terms of all Lithuanian Final Palaeolithic archaeology was a slate pebble with carvings found at Eiguliai 1A site. The full study on the function and meaning of this artefact has been given in section *'Art'*, therefore it will not be repeatedly depicted here. However, it has to be mentioned that the artefact was found in the flint knapping zone No. 2.

Eiguliai 1 site was also known in Lithuanian Stone Age archaeology as yielding some of the earliest features ever discovered, fireplaces in particular. After a small scale excavation has been undertaken by R. Rimantienė, several stains of dark grey sand mixed with ashes and charcoal pieces were interpreted as prehistoric hearths and were thought to date to Final Palaeolithic. The interpretation was soon published and became a well known archaeological discovery. Two of the features mentioned above were unearthed in the find

place Eiguliai 1A (Fig. 121–122, 161). They were of a very dark brown color and were clearly visible in the contrast of surrounding yellow small grained sand. This kind of preservation has indicated that they were most probably of a later dating than Final Palaeolithic. From the stratigraphic point of view, they were unearthed in more or less the same level as an archaeological horizon yielding some burnt flint flakes and a lot of charcoal fragments. According to R. Rimantienė notes, the charcoal could have been of *Pinus sylvestris* wood. However, the pieces were scattered in all the area and did not concentrate particularly around the so called 'hearths'. Also, as R. Rimantienė herself has noticed, a natural forest burning stage was recorded in the area where the site was situated, therefore the burnt artefacts could have been a result of this accident and later processes of bioturbation. Lastly, tens of years after publishing archaeological data about the features found in Eiguliai, in the early 80s the charcoal samples were investigated by ^{14}C dating. The results were not published, but they have proven that the so called 'hearths' were of Early Iron Age[117]. Besides, on the basis of the data recorded (no artefacts in the filling of the features, diameter reaching only 30 cm, etc.), it was almost impossible to make further interpretations about the exact function of those features. Thus, they were discarded as being not important for the reconstruction of the first settling of Eiguliai site from both perspections – dating and function. Presumably, these features could have been tree trunks as well and could have had nothing in relation to archaeology.

Another feature that was considered to be a particularly important discovery at Eiguliai 1A site was a stain interpreted as a remain of a prehistoric building floor. It was unearthed at the same level as one of the so called 'hearths' and was recorded in the stratigraphic drawing (Fig. 161). According to R. Rimantienė, the feature was partly destroyed, yet still some characteristics could be given[118]: it was more than 3 m wide and of semi-circular form. The 'hearths' were interpreted to have been outside the building, whilst another

[117] Personal consultation with Dr R. Rimantienė, 2014 January 17th .

[118] Римантене, Р. К., 1971, Палеолит и мезолит Литвы, Вильнюс, p. 39–40.
Rimantienė, R., 1984, Akmens amžius Lietuvoje, Vilnius, p. 49.

archaeologist who was studying these features suggested an opposite interpretation. According to A. Girininkas, the so called 'hearths' were inside and therefore presumably prehistoric people had most probably stayed at the site during a cold season of the year[119]. However, from the stratigraphic point of view, this feature was a bit higher than the 'hearths', therefore could be comparatively dated to even later period than the Early Iron Age.

According to R. Rimantienė, the site could have overwhelmed an area of around 5000 m^2 and could have been settled repeatedly for many times in Final Palaeolithic. The flint material could have been taken from the sources situated somewhere nearby, therefore prehistoric people did not save it[120]. Her interpretation could be approved, but only reserved presumptions on the site settling duration could be done as the biggest part of the archaeological data was lost and could not be analyzed. The conslusions should be made not taking in consideration the archaeological features which were misleadingly related to Final Palaeolithic. Whilst two flint knapping zones and few tens of flint implements show at least two moments when the flint tools were produced, not necessarily relating them to the same one person. It could have been two different flint knappers who were camping at the site in Final Palaeolithic. Yet a question remained if they were camping at exactly the same time and belonged to the same one group of people. No archaeological features-stains that could be dated to the earliest stage of settling were discovered, probably mainly because the main camping zone could have been in the already destroyed area. Thus, probably some people visited the site and produced flint implements in the Swiderian manner out of the material they had brought with themselves. The implements were used for hunting and hunt prey treatment activity. A lot of flint debitage was left untouched, and it would rather implicate that people did not stay for long. As if they did, they would most probably have used the blades and flakes through time, instead of leaving them laying on the surface all around the campsite. Thus, most probably after the hunt people had abandoned the site.

[119] Girininkas, A., 2009, Lietuvos archeologija: Akmens amžius, Vol. 1, Vilnius, p. 67.

[120] Римантене, Р. К., 1971, Палеолит и мезолит Литвы, Вильнюс, p. 40.
Rimantienė, R., 1984, Akmens amžius Lietuvoje, Vilnius, p. 49.

Eiguliai 1B find place was around 130 m to the south–southW from the find place 1A. It was also located in a sandy area, on a slope of a small prominence about 360–370 m to the east from the river Neris flow, on the second terrace (Map 22 (A), Fig. 123). The site was visited for many times by archaeologists who lived and worked in Kaunas – K. Jablonskis, P. Tarasenka and R. Rimantienė. During the repeatedly organized surveys a big lithic assemblage was collected from the surface. Later, in 1952–1953, R. Rimantienė has excavated 111 m^2 at Eiguliai 1B find place and the archaeological data gained in this investigation was added to the already saved collection of finds. Up until today it was kept in two museums (National Museum of Lithuania and Kaunas Vytautas the Great War Museum).

The visual analysis of lithics has revealed that, similarly to Eiguliai 1A find place, flint material of a good or even high quality was used in Eiguliai 1B find place. However, flakes of a low quality flint with inclusions were also present. Most probably they were produced from the raw material that was found locally.

Flint finds were with patina of various intensiveness due to the postdepositional chemical and physical processes that affected their surface. Some lithics were of a bit reddish color. Whilst part of the collection, including some cores, was affected by high temperature. Therefore it might be assumed that some of the flint knapping process took place at a fireplace.

The flint debitage contains flakes of different size, yet significantly some of them were much larger than it was usual in the flint assemblages found at the sites along the river Neris. These artefacts implicate that the nodules taken to form the cores were quite big and should have weighted a lot (having in mind that presumably they had to be transported or brought to the site). The cores were of various forms: unipolar (conicle as well as 'with a handle'), double-platform and amorphous. Most of them were used for blade production. They were usually not completely used, however, some of them had significant implications of mistakes made in the knapping process, which in most cases became a reason to throw the core away as unusable. On the whole it could be

presumed that flint was used wisely, until the blanks of a good quality were made, but was not saved.

As it could be seen from the proximal parts of the blanks, a hard hitting was applied for the primary detachment of the nodule surface flakes, whilst for blade production a demi-soft and soft percussion was used. Also very small regular blades were present in the collection, but they were almost not used for tool making (or those tools were not discovered). In general, the regular tiny blade production should be more likely related to Late Mesolithic flint knapping technology.

The lithic assemblage was on the most part similar to the one collected in Eiguliai 1A find place. However, it was also a bit different by means of a larger variety of implement types, that has lead to the impression that the site was inhabited in some different periods of Stone Age – in Final Palaeolithic, as well as in Late Mesolithic and Neolithic.

Eiguliai 1B find place yielded not many points, but that small collection was informative. Three points basically were of the same Late Swiderian type as the ones found at Eiguliai 1A find place, yet some specimens could be also regarded as Early Swiderian. They were made of semi regular blades produced from unipolar and double-platform cores and had a tang formed with a flat retouch from ventral side and some marginal retouch from dorsal side (Fig. 22:2–5). The tip of one of them was corrected by several strikes. This technique was not recorded in other Late Swiderian sites along the river Neris, but was common in the sites discovered in Southern Lithuania[121]. Artefacts found at Eiguliai 1B find place were previously interpreted on the basis of the intensiveness of patina. The three Swiderian type points were ascribed to the same one group defined as 'Group 1Bc: finds covered by thin bluish-whitish patina'[122]. However, all three artefacts had very different color, whilst the only things they had in common were the technique used to form them and the

[121] Римантене, Р. К., 1971, Палеолит и мезолит Литвы, Вильнюс, p. 29, Fig. 18:6–7, Fig. 37:7, Fig. 65:3, Fig. 75:2.
Juodagalvis, V., 2001, Glūko 10-oji akmens amžiaus gyvenvietė / In: Akmens amžius Pietų Lietuvoje (geologijos, paleogeografijos ir archeologijos duomenimis), (eds. Baltrūnas, V., *et al.*), Vilnius, p. 186, 187, Fig. 2.36:21, 2.37:7.

[122] Šatavičius, E., 2001, Vėlyvojo paleolito kultūros ir jų likimas ankstyvajame mezolite / Doctoral dissertation, Vilnius University, Vilnius, p. 110.

size/proportions of the tool.

Although the implements described above should be dated to Final Palaeolithic, they were probably not the earliest finds at Eiguliai 1 site. Another point made of a decortication flake with a wide tang formed by a marginal retouch from dorsal site stood out from the assemblage (Fig. 22:1). The technology it was made by could be rather related to Brommean technique than Swiderian, as the bulb of a blank was not detahched or flattened, a flake was used as a blank for point production and the point was of rather rough proportions. Relatively this implement would implicate a visit of totally different group of people, which could typologically pre-date Swiderian settling stage. Therefore at least two different moments of settling could be determined in Final Palaeolithic.

After examining the collection of points only one artefact was not identified neither in National Museum of Lithuania, nor in Kaunas Vytautas the Great War museum. It was a tanged point made of a non-regular blade, with a flattened proximal end by retouch from ventral side, and with a tang part tightened by marginal retouch from dorsal side (Fig. 22:4)[123]. This implement would rather implicate an Early stage of Swiderian culture and a third stage of site settling in Final Palaeolithic. Presumably it could be chronologically later than the Brommean point, yet earlier than Late Swiderian assemblage.

Some other artefacts similar to points were also present in the collection. They were all made of blades produced from unipolar cores, yet the forming technique was neither Swiderian, nor Brommean. Instead, few of them could have been sort of lancets and might have been ascribed to much later period than Neolithic on the basis of tool typology (Fig. 22:7–8).

Scrapers discovered at Eiguliai 1B find place were mostly made of semi-regular blades produced from unipolar as well as double-platform cores (Fig. 23). Few of them were small, whilst the biggest part of these tools was of middle width, and there were no particularly large scraping implements. The working edge was formed either on the distal or proximal part of the blank.

[123] Римантене, Р. К., 1971, Палеолит и мезолит Литвы, Вильнюс, p. 43, Fig. 27:4.

Whilst several tools had scraping edge formed on both parts. Sometimes the sides were also a bit retouched or had some utilization marks. This characteristic could implicate that some of the scrapers might have been handled. No scrutinity in the scraper production could be seen, as all these implements were formed simply using the most fitting blanks. Some further presumptions could be made only on the material that was worked with the scrapers – as no large implements were taken for this work, most probably the material was not big also (maybe a hide of some middle-to-small size animal). One of the scrapers was repeatedly used later as some non-patinated retouch negatives were visible on its edges from dorsal as well as ventral side (Fig. 23:13). Most probably it was done by people who had settled the site much later, maybe in Neolithic. Interestingly, the scraper was chosen among other lithics laying in the sand not only as a useful blank, but was also identified as a scraper – a tool of a particular function. Moreover, if the people who produced the tool in Final Palaeolithic threw it as a waste, some later visitors of the site, e.g. Neolithic settlers, saw it still usable. These presumptions could have correlations with the different level of flint material accessability in those two periods. Significantly, the re-utilization phenomena was detected in Eiguliai site find places 1A and 1B, whilst also in other sites alont the river Neris.

One particular find that was most probably used for scraping stood out because of its form. It was made of a big non-regular blade and had a rather long curved edge retouched by marginal retouch from the dorsal side (Fig. 25:1). There were also a few burins which could have been originally made as scrapers (Fig. 24:4, 6), yet on the opposite, it was done by the same people who had produced them. Thus, it could be assumed that prehistoric people did not bother producing or searching for new blanks when some cutting work had to be done. Decissions on tool making were made quickly and most probably within the limits of one process, e.g. working on one piece of fur.

The burins were formed on both types of the blanks – blades and flakes. Some of them were two-directional, while others had only one-direction cutting angle (Fig. 24). Some retouch was also applied to make a convenient

place to put pressure with a finger without cutting oneself. These details showed that prehistoric people did not mind the form or aesthetics of the cutting tools, instead they were applying some secondary working only when it was a question of basic requirements. Moreover, it seemed that the burins were used not for long time and their cutting angles were not corrected for many times. More likely a different blank was taken to form another burin.

Lithic assemblage also contained some implements of non-determined function (blades and flakes with retouched margins) and few drilling tools. A little part of the assemblage could be typologically ascribed to Late Mesolithic or Neolithic. Moreover, several pottery fragments recorded at the site had also implicated a later stage of settling.

As it was mentioned before, Eiguliai 1 site yielded some prehistoric stains some of which were related to the Stone Age horizon. One of them was unearthed in the find place 1B. It was a 52 cm wide and 42 cm deep feature called 'hearth No. 11', discovered in around 100 cm depth, in relatively the deepest uncovered layer where lithics were also found (Fig. 163–164). According to R. Rimantienė, who has excavated the site, sediment filling of this round form feature was a bit harder that the surrounding sand, it contained a lot of soot and badly preserved pieces of charcoal. Therefore it could be presumed that the feature was affected by fire of a very high temperature and/or for a long time. Close to the feature some lithic artefacts were discovered: a scraper, a small core and a blade[124]. The characteristics described above could lead to a conclusion that it might have been a hearth. However, dating of this feature was at first determined only on the basis of stratigraphy. As the results of Eiguliai 1 site charcoal samples ^{14}C dating were not ever published, in 2014 it became unclear, if only the features found in Eiguliai 1A find place, or also other features unearthed in Eiguliai 1B find place were dated to the Early Iron Age (see section *'Eiguliai 1A find place'*). Yet after R. Rimantienė, „there were no Stone Age hearths in Eiguliai site"[125], therefore

[124] Rimantienė, R., (no date), Eiguliai, manuscript in the National Museum of Lithuania, Vilnius.

[125] R. Rimantienė, personal consultation in 2014–01–17.

presumably also the feature found at Eiguliai 1B find place was dated to later period.

After a small excavation in Eiguliai 1B find place R. Rimantienė has published a plan of lithics distribution (Fig. 163). It has revealed at least one concentration of flint finds recorded during the investigation. It was around 9 m away to the SouthW from the so called 'hearth'. However, the assemblage of finds collected from the surface before the excavation was much more numerous, thus, the recorded distribution of finds was probably a bit different from the actual view of the prehistoric settlement remains (notwithstanding the postdepositional processes that also had an effect on the finds scattering).

To conclude, the find place 1B at Eiguliai site was most probably visited for two or three times in Final Palaeolithic and the very first settlers might have been a group of people (or a person) who knew Brommean technology of flint knapping and tool production. The main purpose of the visit was hunting. Unfortunatelly, it was difficult to ascribe more tools to the Brommean assemblage. It could be also possible that the point was the only and unique find in the find place 1B (yet its relation with Eiguliai 1D find place would be considerable, see section *'Eiguliai 1D'*).

In the end of Final Palaeolithic the area was again visited by Swiderian groups of people, most probably for more than once. The remains of prehistoric feature that was previously related to Final Palaeolithic hearth should be revised and interpreted reservedly. The dating of it migh have been much later as also finds indicating Neolithic or even later settling stages were also discovered at the site.

As it could be reconstructed from the lithic assemblage, the prehistoric people gathered in the area mainly because of the hunting and prey treatment purposes. On the basis of the quantity and quality of the flint debitage left at the site and the manner of tool production a presumption could be made that the visits were short-term, but multiple. Whilst the raw material was brought to the site, knapped in situ, but not completely used or saved.

Eiguliai 1C find place was situated much higher than the rest of the site area, on the edge of the third river Neris terrace above the floodplain. It was 100 m to the east–southeast from the find place Eiguliai 1A and around 510–520 m away from the river flow (Map 22 (A)). The site was never excavated, but an assemblage of archaeological finds was collected from the sandy surface during the repeatedly organized surveys by K. Jablonskis and R. Rimantienė in the 30s–50s. The collection of lithics was not big, it was and still is kept in the National Museum of Lithuania.

As it could be seen from the flint debitage, mostly raw material of poor quality was used. Only few blanks implicate that there probably could have been also several cores of a better quality flint knapped in the area. As all of the finds were laying on the surface, they were mostly colored by patina. Some of the lithics, including one core used for blade production, were affected by high temperature. It could have been resulted by a forest fire in the recent millennium, or it might implicate that some flint knapping activity took place by a fireplace.

There were almost no flint cores discovered, yet the flint knapping technology that was applied for tool production could have been reconstructed from the visual study of the blanks. Most likely unipolar and amorphous cores were prepared, and a soft or demi-soft knapping technique was used to produce blades and flakes.

Collection of lithic implements contained several fragments of tools which could have been points made of semi-regular blades (Fig. 26:1–3). One of them could be typologically ascribed to the Late Swiderian type (Fig. 26:2) as it has a tang flattened by the retouch from the ventral side. Another artefact that could possibly be interpreted as a fragment of a point would be not typical, because its tip would be on the proximal end of the blank (Fig. 26:1), whilst another fragment of a retouched blade distal end was only relatively interpreted as a tip of a point (Fig. 26:3).

Only several finds which could be related to the earliest stage of settling were identified: a scraper made of a rather big flake, a burin with a cutting

angle corrected for multiple times, and some retouched and utilized blades of non-determined function (Fig. 26). One find was interpreted as a fragment of an axe, which, as it could be seen form the marks of utilization, was used for cutting of chopping a hard material (Fig. 26:17). Later it was most probably reproduced into a burin-like tool.

Even though the flint artefacts were not numerous, still part of the assemblage should be related to the late Swiderian group of people and be dated to Final Palaeolithic. Most likely there was a small short-term campsite where some hunting and prey treatment related activity took place. A fireplace could have been made for camping, and some flint knapping could be done next to it. Yet, as part of the implements were re-used and corrected for many times, it might be assumed that prehistoric people did not search for new blanks and did not bother to produce new tools for the work that had to be done. Presumably there was a lack of time, or it was a character of prehistoric people – to put as little effort in tool production as it was possible.

Eiguliai 1D find place was situated in the Southwestern part of the site, around 340 m away to the east from the river flow, on its second terrace above the floodplain. It was quite close to the find place 1B, only 70–80 m southeastwards from it (Map 22 (A)). When the first surveys were organized, the place was already partly destroyed due to the sand mining activity. A bit later an area of 60 m^2 was excavated by R. Rimantienė. After all the investigation done at the site a big flint finds assemblage was collected which was later kept in two museums. Both parts of it were analysed for this study.

As it could be reconstructed from the visual investigation of the flint archaeological finds, a raw material of middle or good quality was used at the find place 1D. A bigger part of the assemblage was with patina of various intensiveness. Some finds were affected by fire. The lithic debitage contained a lot of large flakes, also decortication flakes were numerous. Therefore it might be presumed that flint material was brought to the site in big nodules and then knapped in situ.

Eiguliai 1D find place yielded the highest number of cores (Fig. 34). They were mostly double-platform and multidirectional of non-determined form. Also some knapped flint pebbles were present. Presumably, they were used for flake production. As it could be seen from the negatives of the blanks, most usually a semi-soft and soft knapping technique was applied for blade production.

The lithic assemblage contained various types of implements. Four leaf form points with a flat retouch on the ventral side of the tang were ascribed to the Late Swiderian type (Fig. 27:1–4). They were all made of semi-regular blades. Two of them were also retouched a bit from the dorsal side. One point stood out as all the perimeter of its edges was retouched from the ventral side by a marginal retouch and some flat retouch was applied on its proximal part, most probably because the bulb was flattened (Fig. 27:6). It was produced from a non-regular blade, and was also of a leaf form. R. Rimantienė has interpreted that artefact as a retouched type burin with a tang[126]. Also three different fragments of retouched blades were present. Presumably they could be interpreted as fragmented points (Fig. 27:5, 7–8). However, it was unclear if they could be related to the Swiderian tool kit, therefore a question remained if the place was settled for once or for more times in Final Palaeolithic.

Scrapers and burins were the most numerous tools in the lithic assemblage of Eiguliai 1D find place. The scrapers varied a lot, although most of them were formed on blades and had only one scraping edge (Fig. 28–29). One of the scraper stood out as having two directional scraping edge formed on the distal part of the flake from ventral and dorsal sides (Fig. 29:11). It had utilization marks on both of the working edges and was also used as a burin. Some of the scrapers were retouched on sides or had some marks of utilization, therefore it might be assumed that part of these tools were handled. The width of the scraping edge was very different – starting from 1 cm, up to 5–6 cm. Thus, most likely scraping tools were needed for working on some material of different size and hardness. Some of the scrapers were also used as burins as

[126] Римантене, Р. К., 1971, Палеолит и мезолит Литвы, Вильнюс, p. 45.

the cutting angles were formed on them (Fig. 28:6, 29:6, 9, 11). The biggest scrapers were formed on flakes, and only few of them were made of decortication flakes. This characteristic could also show how rich with flint material the prehistoric people were in Eiguliai 1 site, as in some other sites along the river Neris (e.g. Kernavė 3) scrapers were made on decortication flakes much more often. Probably most of the scraping tools discovered at the find place Eiguliai 1D should be related to the Final Palaeolithic settling stage.

The toolkit for cutting was comparatively the biggest, as more than 30 burins made of various blanks were collected during the survey investigation and excavation at the site (Fig. 30–31). Apparently cutting and dividing activity was very important ant took a lot of time. It would be proven not only by the number of burins, but also because most of them were corrected for multiple times and intensively used. Presumably a lot of material – meat/fur/leather – that had to be divided was present in the find place Eiguliai 1D. Most probably it was a result of a very successful hunt, a big number of catched prey which had to be worked. It could also be assumed that the material which was cut was quite hard as many of the burins were found fragmented and broken (only top parts left), most probably, due to the big pressure put on them. Some burins were with retouched edges on the parts of the tool that had to be convenient to keep fingers on and not to cut oneself. Almost all of the burins were two-directional.

A lot of implements of non-determined or some particular function were found in the assemblage of lithics (Fig. 32–33). Retouched blades and flakes, knives, an axe as well as some drilling tools implicated that various activities took place at the site during the Final Palaeolithic group of people stay. Therefore it would be most likely that these people had stayed there for a bit longer: some time before the hunt while producing the toolkit, then during the hunt, and after it until all the prey treatment was finished. Presumably, the hunt was successful and could have included more than one group of hunters.

The biggest part of the assemblage should be ascribed to the Late Swiderian group (-s) of visitors. Yet as relatively close, in the find place Eiguliai 1B, situated around 70 m away, a Brommean point was discovered without any

additional finds which could be related to it, it could be presumed, that some of the artefacts found in the find place 1D might belong to the Brommean toolkit, e.g. some scrapers and burins made of large flakes.

In the same archaeological horizon where the flint artefacts were recorded during the excavation some prehistoric features were unearthed. After R. Rimantienė who has investigated the site, two hearths and several concentrations of lithics were identified. The small depictions, excavation plans and drawings was the only data that has left until today[127] (Fig. 124, 162, 165–166), as the features were not photographed (like it was in Eiguliai 1A find place). One of the presumed hearths, the so called hearth No. 1, was of 60 cm width and 25 cm depth, it was recorded in the deepest small grained sand layer yielding Stone Age artefacts. There were some burnt wood fragments and flint finds with intensive patina coloring found in the filling of it. Whilst another feature was depicted as a stain of a different color sediment filled with soot and charcoal fragments, it contained no lithics. Therefore it was considered not as a prehistoric hearth, but a burnt wooden structure or a tree trunk instead. Its diameter was of 75 cm, and the depth of it reached 35 cm. The feature was unearthed in the same stratigraphic layer as the 'hearth No. 1. Yet even though they could have been related to the same chronological period, most probably they were not of a same function. Moreover, as the sediments of the two stains discovered in Eiguliai 1D find place were not harder and did not change color due to the effect of fire, it might be presumed that no high temperature was reached in the process of burning, or the burning took a short time. That would be a main difference between the features unearthed in Eiguliai 1B and in 1D find places.

To add, the interpretation of features described above was considerable not only because of the non determined function, but also due to the lacking data on their ^{14}C dating. As it was mentioned earlier, some charcoal samples from Eiguliai 1 site were investigated and the results did not correlate with the lithic assemblage found at the site as they were dated to the Early Iron Age.

[127] Rimantienė, R., (no date), Eiguliai, manuscript in the National Museum of Lithuania, Vilnius.

The two features from the southwestern part of the site, the find place 1D, could have also been of alike dating. Therefore they should be interpreted as a part of the first settlers campsite very reservedly.

As it was drawn in the site excavation plan, quite close to the so called 'hearth No. 1' an area of 40 cm width where flint artefacts were concentrating was recorded[128]. It was about 1,5 m away to the west from the hearth. The concentration of lithics could implicate that some flint knapping activity zone was situated close to a fireplace, as some burnt artefacts were also present.

Another cummulation of flint finds was recorded much further to the South, around 5 m away from the hearth No. 1. Both concentrations yielded flint cores and retouched blanks: in one of them around 10% of the finds were retouched, while in the other one – up to 40% of finds. It would seem most likely that these two flint knapping zones were used not only for blank production, but for tool making as well. What would be more, it could be presumed that many blanks were retouched, but soon were thrown away because of not fitting the idea of a desired form of an implement. Thus, some different interpretations could be given: either the flint knapper was not skilled enough (as it could have been a kid still learning to produce implements), or was very precise and had spent a lot of time for the process of tool making.

If the site was settled for a longer period of time, it would have been reasonable to shovel the amount of flint waste as it was recorded in Eiguliai 1D area. Moreover, a flint knapping zone usually exceeds an area limit of 40 cm. Then it would seem likely that the concentrations described above were a result of shoveling, yet a bit scattered due to later postdepositional processes.

However, the distribution of flint artefacts had differed a bit when every find collected in all the stratigraphic layers was taken into account (Fig. 162). As it could be seen from a lithics distribution plan, an additional cummulation of flint finds could be determined about 3 m to the West–SouthW from the so called hearth No. 1. Thus, at least three concentrations could have been distinguished in the excavated area instead of two, yet they could have been of

[128] Rimantienė, R., (no date), Eiguliai, manuscript, the National Museum of Lithuania, Department of Archaeology, Vilnius.

different chronology.

To sum up, the lithic assemblage, typology of flint artefacts and the Late Swiderian manner of flint knapping techniques applied to produce them had implicated a Final Palaeolithic stage of site settling. Presumably, a group of prehistoric hunters were staying there for a bit longer time until a large amount of hunting prey was treated. While some different types of points stood out showing that the site could have been visited more than once or by several different groups of people. Yet it would be still questionable if the Late Swiderians should be seen as the very first visitors of the site. A relation between the flint assemblages collected from Eiguliai 1B and 1D find places should be taken in consideration, especially when analyzing a presumed Brommean tool kit.

The flint knapping activity took place in several zones, therefore assumedly few different people could have produced the implements. Some of this work could have taken place close to a fireplace, if one was proved to have existed at the site in Final Palaeolithic. The other archaeological data which was not analyzed in this study – fragments of pottery and some flint artefacts typical to Neolithic or Bronze Age – had proved that the site was repeatedly settled thousands of years later, when the remains of the first campsites were most probably covered by a layer of Aeolian sand. Still, the finds of both archaeological horizons had mixed through time and moved vertically as well as horizontally.

***

To conclude, Eiguliai 1 site was a wide scattered site in a sandy bank of the river Neris. Some places in an area of more than 50 000 m2 could have been occupied for many times in Final Palaeolithic. Most likely the very first visitors were people who knew Brommean technology of tool production and came to camp in the wide sands of Eiguliai in the first half of Late Dryas. Whilst later the site was also settled by groups of hunters whose tool kit was made by the Late Swiderian technique. The site was probably important from a hunting-strategical point of view, as it was rather close to the intersection of

two big rivers. A small tributary, however, could have not play a role as there might have been some small water streams closer to Eiguliai sands.

As it could be reconstructed from the archaeological data, hunting activity, also preparation for it and some prey treatment work after it were the main purposes why prehistoric people stayed at the site. Presumably, one of the hunts had been of a large scale, therefore groups of people had to camp there for longer. Some archaeological features – one or two presumed hearths – could be reservedly interpreted as remains of a prehistoric settlement.

The site could have been visited for several times by the same group of Late Swiderian people, as well as become a place where several related groups of hunters had gathered. These people knew some high quality flint source (-es) relatively close to the site and brought many nodules for tool production. However, a great amount of the flint waste left behind has shown that the Final Palaeolithic inhabitants did not consider the area as a place to stay for longer. Also, it seemed they did not see it worth to save the flint, as most probably they knew they were soon be heading southwards, where the flint material could was easily available.

Gavėnonys site

Gavėnonys site was localized in early 20th century as a place on the river Šventoji left bank, close to Gavėnonys village without any other indications of an exact location. It was also included as a separate site in the atlas of archaeological objects in the mid 70s[129]. However, a monument marking the Gavėnonys prehistoric site was later built in the place where Samantonys prehistoric settlement was situated and excavated (see section *'Samantonys 1 site'* and Map 38 (R)). Therefore the relation between these two places could be taken under consideration, as Gavėnonys site might be a part of the same Samantonys site or could be related to/included in it's site-catchment area. However, the lithic finds were difficult to date, and some Neolithic–Bronze Age artefacts found at the same place showed, that it might have been multilayered

[129] Rimantienė, R., 1974, Akmens amžiaus paminklai / In: Lietuvos TSR archeologijos atlasas. Akmens ir žalvario amžiaus paminklai, Vol. I, LTSR Mokslų akademijos istorijos institutas, Vilnius, p. 35, depiction No. 67.

(just as Samantonys site was). The local inhabitants of today say that the border between the two villages has changed through time therefore some discrepancies could have emerged in the heritage protection system.

The lithic collection contained several finds – a retouched reparation flake of a conical core and a middle part of a blade, produced from an unipolar core (Fig. 111). Not much could be said about the function of Gavėnonys site. It could have been a flint knapping and blade production/tool making zone.

Gudeliai site

Gudeliai site (a. k. a. Lenkiškiai, Lenkiškė) was first discovered as an Iron Age barrow site in the beginning of the 20th century[130]. The village was also visited in the early 40s for several times by K. Jablonskis[131] who has recorded few places where flint finds were found (including the barrow site). Only after four decades the barrow site was investigated archaeologically[132]. During a small scale rescue excavation some lithics were collected, therefore afterwards it became also known as a Stone Age site. In 2002 a research project was initiated with an aim to investigate the barrows[133]. As it continued up until 2008[134], an assemblage of flint artefacts was collected from the non-destroyed parts of the prehistoric site horizon and from disturbed sediments. These finds as well as some archaeological data about the unearthed prehistoric features was analyzed in this study.

The site was located close to the village Gudeliai, on the right bank of the river Neris, around 5–6 m above water level, on the first river terrace above floodplain. A small tributary Sudervė was running into the river Neris

[130] Tarasenka, P., 1928, Lietuvos archeologijos medžiaga, Kaunas, p. 239.

[131] Jablonskis, K., 1942, Survey diary, Archive of the Lithuanian National Museum, Department of Archaeology, Vilnius, p. 64.

[132] Balčiūnas, J., Dakanis, B., Zabiela, G., 1988, Vilniaus miesto ir rajono archeologijos paminklų žvalgymas 1987 m. / In: Archeologiniai tyrinėjimai Lietuvoje 1986 ir 1987 metais, Vilnius, p. 177–178.
Strazdas, A., 1990, Gudelių-Lenkiškių pilkapyno tyrinėjimai / In: Archeologiniai tyrinėjimai Lietuvoje 1988 ir 1989 metais, Vilnius, p. 63–65.
Strazdas, A., 1990, Gudelių (Lenkiškių), Buivydiškių apyl., Vilniaus raj., pilkapyno 1988-1989 m. tyrinėjimų ataskaita, excavation report, National Museum of Lithuania, No. IEM465.

[133] Kurila, L., 2005 Gudelių (Lenkiškių) pilkapynas / In: Archeologiniai tyrinėjimai Lietuvoje 2002 metais, Vilnius, p. 69–72.

[134] Kurila, L., 2005 Gudelių (Lenkiškių) pilkapynas / In: Archeologiniai tyrinėjimai Lietuvoje 2002 metais, Vilnius, p. 69–72.
Kurila, L., 2005 Gudelių (Lenkiškių) pilkapynas / In: Archeologiniai tyrinėjimai Lietuvoje 2003 metais, Vilnius, p. 91–93.
Kurila, L., 2006 Gudelių (Lenkiškių) pilkapynas / In: Archeologiniai tyrinėjimai Lietuvoje 2004 metais, Vilnius, p. 80–83.
Kurila, L., 2006 Gudelių (Lenkiškių) pilkapynas / In: Archeologiniai tyrinėjimai Lietuvoje 2005 metais, Vilnius, p. 92–96.
Kurila, L., 2007 Gudelių (Lenkiškių) pilkapynas / In: Archeologiniai tyrinėjimai Lietuvoje 2006 metais, Vilnius, p. 121–124.
Kurila, L., 2008 Gudelių (Lenkiškių) pilkapynas / In: Archeologiniai tyrinėjimai Lietuvoje 2007 metais, Vilnius, p. 160–163.
Kurila, L., 2009 Gudelių (Lenkiškių) pilkapynas / In: Archeologiniai tyrinėjimai Lietuvoje 2008 metais, Vilnius, p. 106–108.

approximately 150–270 m away to the north–northwest from the site (Map 36 (O)). The place was sandy, and the big river was flowing in a distance of 70 m.

On the basis of the archaeological data recorded during the excavation of the barrows a preliminary lithic finds distribution could be reconstructed (Fig. 167). As the majority of the artefacts were collected in the southern part of the excavated area, it might be presumed, that the central area of the site was approximately 60–70 m away from the river. Thus, it seems that the small tributary was not the main natural point of attraction when the place for camping was chosen.

The excavation of the area had revealed that the Stone Age finds horizon was not deep, however, as the surface ground was disturbed due to the construction of the barrows, the exact depth of the earliest settlement layer could not be determined. According to L. Kurila who has excavated the barrow site, the natural ground was yellow sand, and the archaeological investigation was done until this layer was reached. However, statistically almost all sites along the river Neris yielded some part of the finds in the lowest ground layer which was either medium grained gravel, or white small grained sand, sometimes colored with limonite stripes. Thus, as it could be reconstructed on the basis of the photos of archaeological excavation and the textual information about the site stratigraphy, it could be possible that the lowest layer was not excavated and some of the flint finds might have remained uncovered.

Even though the exact distribution of the flint finds was recorded during the excavation, the big part of the finds were not even in an approximate location, as during the building of the barrows the sediments might have been disturbed for several times and therefore the finds could even have shifted. Thus, only the non-disturbed ground level where some greyish spots mixed with ashes and charcoal pieces – presumed prehistoric features – could have been examined. Some of the features which were assumedly identified as relating to the Stone Age horizon were unearthed under barrows No. 62 and 56 (Fig. 125), while during the investigation of barrow No. 68 a presumed cultural layer was uncovered: a wide and rather thin greyish sand lense yielding flint

artefacts[135]. However, none of the prehistoric features could have been investigated further and no samples for ^{14}C dating were taken for future research. Yet the site could still be partly excavated and some clarifications on the site dating and reconstruction of occupation character would be possible.

The lithic assemblage was not taken into scientific discussion or thoroughly analyzed. According to the information in the excavation reports, it should be dated to Mesolithic and be related to Kunda culture[136].

As it could be reconstructed from the negatives of the flint finds, both – semi-regular and regular blade production technology was used at the site. Semi-regular blades were produced either from double-platform or unipolar cores, while regular blades were made by working only on one direction cores. These two applied technologies might implicate two different stages of site settling: the first one in Final Palaeolithic, and a later stage in Early Mesolithic.

The flint material used at the site was on the most part of a good quality. Some of the finds were quite intensively patinated. Significantly or not, the most patinated (white or whitish) implements were also typologically considered as chronologically one of the earliest finds at the site (Fig. 35:3, 12, 14). Small part of the assemblage was affected by high temperature. However, during the barrow installation fire was used for various purposes and the burnt lithics might be a result of those processes. Yet also a presumption that a Stone Age fireplace was situated somewhere in the excavated area would be acceptable.

The lithic assemblage was not large, yet it contained various finds that could implicate at least several episodes of site occupation. Typologically the earliest flint implements could be ascribed to the very end of Final Palaeolithic. One fragmented leaf-form point made of a regular blade was formed in a typical Swiderian way, by flat retouch applied on the ventral side of the blank,

[135] Kurila, L., 2009, Gudelių–Lenkiškių pilkapyno (Vilniaus r.) (A1237P) archeologinių tyrinėjimų 2008 metais ataskaita, excavation report, National Museum of Lithuania, Vilnius.
Kurila, L., 2008, Gudelių–Lenkiškių pilkapyno (Vilniaus r.) (A1237P) archeologinių tyrinėjimų 2007 metais ataskaita, excavation report, National Museum of Lithuania, Vilnius.
Kurila, L., 2007, Gudelių–Lenkiškių pilkapyno (Vilniaus r.) (A1237P) archeologinių tyrinėjimų 2006 metais ataskaita, excavation report, National Museum of Lithuania, Vilnius.
Kurila, L., 2006, Gudelių–Lenkiškių pilkapyno (Vilniaus r.) (A1237P) archeologinių tyrinėjimų 2005 metais ataskaita, excavation report, National Museum of Lithuania, Vilnius.
Kurila, L., 2005, Gudelių–Lenkiškių pilkapyno (Vilniaus r.) (A1237P) archeologinių tyrinėjimų 2004 metais ataskaita, excavation report, National Museum of Lithuania, Vilnius.

[136] Kurila, L., 2009 Gudelių (Lenkiškių) pilkapynas / In: Archeologiniai tyrinėjimai Lietuvoje 2008 metais, Vilnius, p. 106–108.

and some marginal retouch from the dorsal side to form a tang (Fig. 35:1). This artefact could be of Late Swiderian type. It was found in the disturbed sediments of the barrow No. 68 (Fig. 167), in the southernmost part of the site. Another fragmented implement was interpreted as a tang part of a point (Fig. 35:2). It was made of a semi-regular blade. The right edge was formed by some marginal retouch from dorsal side, while the bulb was knapped away by one flat retouch strike. If this artefact was considered as a point, typologically it could be related to some Final Palaeolithic leaf point producing technology, either Swiderian or Ahrensburgian. The third artefacts which was presumedly ascribed to the earliest stage of site occupation was a distal fragment of a non regular blade with some utilization and small retouch marks on both sides (Fig. 35:3). It could be interpreted as a tip of a rather big point or as a fragment of some other type of implement. The earliest tool kit could also include some of the retouched and utilized semi-regular blades, few burins and part of the scrapers collection (Fig. 35–36).

Another stage of site occupation might be related to the Late Swiderian/Kunda culture on the basis of the technology which was applied to form one of the artefacts. It was regular blade produced from an unipolar core with a tip formed on a distal end using flat retouch from the ventral side as well as some marginal retouch applied on the right edge from the distal side (Fig. 35:4). Presumably the artefact should be interpreted as a partly produced point. If the retouched part was considered as a tip of the implement, it could remind a point of Pulli type. However, if it was seen as a tang, then the implement would remind a Late Swiderian point. As the very end of the formed narrowing was very regular and sharp, it should be more likely interpreted as a tip. Thus, it might be dated to Early Mesolithic as well as some other tools made of regular blades produced from unipolar cores. It was discovered during the excavation of the barrow No. 68, relatively close to the Swiderian point which was depicted earlier.

Scrapers found at the site were not very numerous, however, at least three or four of them were related on the basis of a manner they were formed

by. Made on semi-regular blades and with one or two sides retouched by marginal retouch these implements could be taken into consideration as products of one flint knapper (Fig. 36:1–3, 6). Alike scrapers were found only in two places in the river Neris basin, both related to Late Swiderian and/or Kunda culture: in Kernavė 3 and Jara 1–Jara 2 sites.

Other scrapers found at the site were made on various blanks, some of them could probably be related to the later stage of site settling than Final Palaeolithic. Scraping tools differed in width of the working edge.

There were also some other flint tools present: several burins, retouched or utilized blanks and some implements of non determined function. The majority of these finds could be related to both – Final Palaeolithic and Early Mesolithic – assemblage, as well as to some later periods. The multiple site settling was also implicated by a tool with evidence of later retouch and use (Fig. 35:17).

As it could be reconstructed from the lithic typology, the site was visited at least for several times. The very first stage of occupation could be related to the Late Swiderian group of people who had come for some hunting purpose, whilst the presence of people who knew Ahrensburgian manner of tool making would be disputable. The next stage would most probably relate to Early Mesolithic settlers. However, as only one artefact was considered to be surely ascribed to this stage (Fig. 35:4), and it was not even completely produced or used, it would be difficult to make further interpretations. Some larger scale excavations would most likely provide more information that would clarify the dating and longevity of site settling episodes.

Gudžioniai site

Gudžioniai site was accidentaly discovered by an archaeology lover in 2006. It was situated on a right river Neris bank, on the third terrace above the floodplain. The site was in a sandy prominence around 170–200 m westwards from the tributary Lokys which runs into the river Neris. Today the place is located around 200 m away and approximately 33 m higher than the nowadays

river flow, and around 1700 m westwards from an intersection of two big rivers – Neris and Šventoji (Map 27 (F)). As the area was ploughed for many years, the archaeological finds were exposed on the surface.

The flint finds collection was very small (only 10 finds in total), though telling a lot of information about the first settlers. The finds were covered by thick patina. Three finds were scrapers made from long and wide blades (Fig. 111). One of the scrapers had some features typical for Final Palaeolithic cultures: it was made from a blade struck off from a double-platform core and its scraping edge was formed at the proximal part of the blank. All the scrapers had utilization marks on side edges which could have been resulted by handling. Also some wide non-regular utilized blades were found. These could have been used for cutting some soft or demi-soft material.

The artefacts should be dated to Final Palaeolithic and belong to the same group of people who had probably treated their hunt prey in Gudžioniai site. The scrapers and 'knives' could have been used for hide working. As the tools are of a very good quality flint usually inherent for the Southern Lithuania and almost no flint knapping residue was discovered in situ, it might be presumed that people had rather come to Gudžioniai carrying the tools with themselves than produced them at the site.

The place could be described as an activity zone instead of a campsite, whilst a potential bigger site could still be discovered somewhere nearby, maybe closer to the tributary Lokys. In 2015 the ploughed area was revisited and a small surface survey was organized, however, no artefacts were found.

Jara 1 and 2 sites

Jara 1 and 2 archaeological sites were discovered by A. Girininkas in 1975 during a survey along Jara river. Both sites were situated in the northern part of the river Neris basin, on the right bank of the river Jara, on its first terrace. The distance between the sites was around 400 metres. Jara 1 site was close to a small tributary Aluotis, whilst Jara 2 was situated further upstream to the N, at the point where the river flows out of a previously existed lake (Map 40 (T)).

The lithic assemblage was analyzed by archaeologists at the end of 20th century and was related to Neolithic[137] as some characteristic pottery fragments were also found at the sites. The flint artefacts were only partly published. A bit later the area of Jara river and lake was also mentioned as being settled in Mesolithic too[138], but it seems that this presumption was only made on the basis of antler finds that site yielded, not the lithics. Unfortunately, no more information about the flint archaeological material was presented.

After the analysis on the flint artefacts was done, a presumption was made that the **Jara 1** site was probably settled for at least few times and the earliest stage of settling could have been in Early Mesolithic or even in Final Palaeolithic. This interpretation is based on some artefacts which are typical to the earlier periods than Neolithic: a point of Pulli type (Fig. 37:1), a fragmented leaf form point (?) which might be related to Ahrensburgian culture (Fig. 37:2) and one tool made of a core reparation flake (a probable point) (Fig. 37:3). A massive burin and the collection of scrapers made of quite wide decortication blades and flakes (Fig. 37) could be also typologically ascribed to Final Palaeolithic or Early Mesolithic. Lithic assemblage from Jara 1 site contains many non-regular blades and flakes produced from double-platform and amorphous cores. It is probable that one core was rather big and was used to produce various blanks at the site as could be seen from a great amount of fitting flakes (most of them were with the remains of surface cortex) which were collected during the excavation. All these finds could belong to Early Mesolithic rather than Neolithic period even though the biggest part of the lithic assemblage and the collection of pottery fragments were of Neolithic or Bronze Age. It seems that E. Šatavičius would suggest the same interpretation by marking 'Jotkonys site' (a renamed Jara 1 site?) in his lately published map of Early Mesolithic site distribution in Lithuania[139] (Map 21). It could also be noticed

[137] Girininkas, A., 2009, Lietuvos archeologija: Akmens amžius, Vol. 1, Vilnius, p. 142–143.
Rimantienė, R., 1984, Akmens amžius Lietuvoje, Vilnius, p. 142.
Girininkas, A., 1978, Šiaurės rytų Lietuvos akmens amžiaus paminklai (2. Jaros II vidurinio neolito (III tūkstantmetis prieš m. e.) gyvenvietė) / In: Lietuvos TSR Mokslų akademijos darbai, A, Vol. 3 (64), p. 63–72.

[138] Juodagalvis, V., 2008, Mezolitas / In: Lietuvos istorija, A. Girininkas (ed.), Vilnius, Vol. 1, p. 59.

[139] Šatavičius, E., 2016, The First Palaeolithic Inhabitants and the Mesolithic in Lithuanian Territory / In: A Hundred Years of Archaeological Discoveries in Lithuania, Vilnius, p. 32, Fig. 29A:36.

that some of the cores brought into the site by earliest inhabitants might have been re-used by later settlers, as there were number of totally used flint cores found in both sites.

The previously presented interpretation of Jara 1 site was very similar to the presumptions on the archaeological data from **Jara 2** site – it was also ascribed to Neolithic. However, some artefacts in the lithic assemblage were also more typical for earlier period than Neolithic: scrapers made of the blanks produced from double-platform cores (few of them with the scraping edge formed on the proximal end of the blank) and crested blades related to the formation of the double-platform core. Back in 1979 A. Girininkas had already noticed that some of the scrapers from Jara 2 site resembled to the ones characteristic to Mesolithic, though he had still related them to Neolithic[140]. Despite the fact that no artefacts dating to Final Palaeolithic or Mesolithic (e.g. points) were present at Jara 2 site, the flint knapping techniques used to produce a part of the blanks found in the lithic collection should be more likely related to the earlier stages of settling.

If the presumption that Jara 1 and 2 sites were already inhabited in Early Mesolithic was taken in consideration, the interpretation of the lithic implements could be as follows: the sites were visited by people who undoubtedly brought some flint nodules with them. The camping should not have lasted for long as the tools were not numerous. The points found in Jara 1 site should be related to hunting activity, though the place on the intersection of the river and a lake should have been also convenient for fishing.

Kaunas 2 site

The site was situated in the lower reaches of the river Neris, 3,5 km upstream from the intersection with Neman. It was on the third terrace on the left bank of the river Neris, and on a right bank of a small tributary or ravine, formed by some temporary water springs[141] (Map 22 (A)).

[140] Girininkas, A., 1978, Šiaurės rytų Lietuvos akmens amžiaus paminklai (2. Jaros II vidurinio neolito (III tūkstantmetis prieš m. e.) gyvenvietė) / In: Lietuvos TSR Mokslų akademijos darbai, A, Vol. 3 (64), p. 66–67.

[141] After prof. P. Šinkūnas, personal consultation in 2017.

Nowadays the place is in the center of Kaunas town. The site was located in 1936 after finding a flint scraper. After ten years there were some more flint finds discovered by K. Jablonskis. A small collection of artefacts was kept in his archive and was named 'Kaunas 2 site'. In 1947 archaeologist typologically dated the flint assemblage from Kaunas to Mesolithic[142]. However, the finds were found separately in various places (though in the same area) and not at the same time. Therefore they could only reservedly be interpreted as belonging to the same site.

All the finds in the relatively small collection were covered by thick patina. There were some artefacts affected by high temperature. The assemblage contained some big flint flakes, few blades and some flint tools: two burins, one long scraper made from a flake and some retouched blanks (Fig. 39). Also a flint core reparation flake and a unipolar core were found.

The flint knapping technique used in Kaunas 2 site can be reconstructed from the negatives on the blanks and the core residues. As follows, the double-platform as well as unipolar cores were used to produce implements in the site. The flint quality was not high, therefore it seems that local nodules could have been used for tool producing. It is not possible to determine for how many times the site was revisited in the past. However, the flint knapping techniques and the tool types found in the site show that it might have been settled in Final Palaeolithic or the first part of Mesolithic.

Kernavė 1, 2 and 3 sites

The existance of the Stone Age settling remains in Kernavė surroundings was first approved in the beginning of 20th century, when some flint finds were discovered there in several places on the right bank of the river Neris by P. Tarasenka[143]. Yet, the discovered place was to the north from Kernavė village, presumably, somewhere close to Lielupė river. In the following decades the

[142] Jablonskis, K., 1947, 1947 metai (Slownik), Survey diary, Archive of the Lithuanian National Museum, Department of Archaeology, Vilnius, p. 1, 3, 7–8.

[143] Tarasenka, P., 1922, Ieškojimai Neries ir Šventosios santeklyje / In: Mūsų senovė, Vol. 1, book No. 4–5, p. 587.
Tarasenka P., 1924, Panerio pirmykštės kultūros sėdybos (nuo Kernavės iki Kauno), Kultūra, No. 7–8, p. 301–308
Tarasenka, P., 1928, Lietuvos archeologijos medžiaga, Kaunas, p. 155.

village was visited for only a few times, though almost no Stone Age artefacts were found on the surface[144]. Until the early 80s the area was still not officially protected as a Stone Age site[145]. Back then, after organizing some survey expeditions, sparse lithic artefacts were interpreted as random Neolithic finds, as no other archaeological Stone Age features were determined[146]. The continuous archaeological investigation in Kernavė and its surroundings was initiated by A. Luchtanas in 1989 and lasted up to 2003. Also some parts of the site were excavated later, in 2013, 2015 and 2017[147]. The typological dating of lithic assemblage was clarified every year and in the late 90s several stages of settlement were distinguished[148]. However, the lithic assemblage was never published and thoroughly studied.

Archaeological finds of various periods were discovered in several places on the first terrace of the river Neris. Up until today at least three Stone Age sites were localized in Kernavė town area on the right river Neris bank[149]. In this study they were named as Kernavė 1, 2 and 3 sites (Map 32 (K)).

---

[144] K. Jablonskis collection in the National Museum of Lithuania, Vilnius.

[145] Lietuvos TSR Širvintų rajono kultūros ir gamtos paminklų katalogas, 1977, Vilnius, Respublikinis žemėtvarkos projektavimo institutas, Archive of the Centre of Cultural Heritage, file No. 4-1-25.

[146] Luchtanas, A., 1984, Gyvenvietės prie Kernavės tyrinėjimai 1983 m. / In: Archeologiniai tyrinėjimai Lietuvoje 1982-1983 metais, p. 28–31, Vilnius.
Luchtanas, A., 1986, Gyvenvietė Kernavėje Neries krante / In: Archeologiniai tyrinėjimai Lietuvoje 1984-1985 metais, p. 30–32, Vilnius.
Luchtanas, A., 1990, Žvalgomieji tyrinėjimai Kernavėje ir jos apylinkėse / In: Archeologiniai tyrinėjimai Lietuvoje 1988-1989 metais, p. 193–196, Vilnius.

[147] Vengalis, R., 2014, Tyrimai Kernavės senovės gyvenvietėje / In: Archeologiniai tyrinėjimai Lietuvoje 2013 metais, p. 98–104, Vilnius.
Vėlius, G., Vengalis, R., 2016, Tyrimai Kernavės archeologinėje vietovėje / In: Archeologiniai tyrimai Lietuvoje 2015 metais, p. 141–148, Vilnius.
Vengalis, R., 2017, Kernavės archeologinės vietovės (Širvintų r. sav., Kernavės sen.) archeologinių žvalgymų 2016 m. ataskaita, excavation report, Museum of Kernavė Archaeological Site.

[148] Luchtanas, A., 1998, Gyvenviečių ir kapinyno tyrinėjimai Kernavėje, Pajautos slėnyje, 1996 ir 1997 metais / In: Archeologiniai tyrimai Lietuvoje 1996-1997 metais, p. 82–86, Vilnius.

[149] Luchtanas, A., 1984, Gyvenvietės prie Kernavės tyrinėjimai 1983 m. / In: Archeologiniai tyrimai Lietuvoje 1982-1983 metais, p. 28–31, Vilnius.
Luchtanas, A., 1986, Gyvenvietė Kernavėje Neries krante / In: Archeologiniai tyrimai Lietuvoje 1984-1985 metais, p. 30–32, Vilnius.
Luchtanas, A., Merkytė, I., Abaravičius, G., 1989, Žvalgomieji tyrinėjimai Kernavės archeologijos ir istorijos rezervatinio muziejaus teritorijoje ir apylinkėse 1989 metais. Ataskaita /Kernavės alkvietė, Mitkiškių gyv., Kernavės (Kriveikiškių) piliak., Ardiškio gyv., Širvintų raj., Archive of the Lithuanian Institute of History, file No. 1659, Vilnius.
Luchtanas, A., 1990, Kapinynas ir gyvenvietės Kernavėje, Pajautos slėnyje (Mitkiškių vnk.) /Širvintų raj./ 1990 metų archeologinių tyrinėjimų ataskaita, Archive of the Lithuanian Institute of History, file No. 1727, Vilnius.
Luchtanas, A., 1990, Žvalgomieji tyrinėjimai Kernavėje ir jos apylinkėse / In: Archeologiniai tyrimai Lietuvoje 1988-1989 metais, p. 193–196, Vilnius.
Luchtanas, A., 1991, Kapinyno ir gyvenviečių Kernavėje, Pajautos slėnyje (Mitkiškių vnk.) /Širvintų raj./ 1991 metų archeologinių tyrinėjimų ataskaita, Archive of the Lithuanian Institute of History, file No. 1826, Vilnius.
Luchtanas, A., 1992, Kernavės pušyno prie Neries archeologiniai tyrinėjimai 1991 m. / In: Archeologiniai tyrimai Lietuvoje 1990-1991 metais, Vol. 1, p. 27–29, Vilnius.
Luchtanas, A., 1997, Kernavės senovės gyvenvietės (AR 1660) 1997 m. archeologinių tyrinėjimų ataskaita, Archive of the Lithuanian Institute of History, file No. 2956, Vilnius.
Luchtanas, A., 1998, Gyvenviečių ir kapinyno tyrinėjimai Kernavėje, Pajautos slėnyje, 1996 ir 1997 metais / In: Archeologiniai tyrimai Lietuvoje 1996-1997 metais, p. 82–86, Vilnius.
Luchtanas, A., 2004, Gyvenviečių tyrinėjimai Kernavėje, Pajautos slėnyje / In: Archeologiniai tyrimai Lietuvoje 2003 metais, p. 43–45, Vilnius.
Vengalis, R., 2011, Kernavės senovės gyvenvietės ir miesto archeologiniai tyrimai magnetinių anomalijų vietose / In: Archeologiniai tyrimai Lietuvoje 2010 metais, p. 83–87, Vilnius.
Vengalis, R., 2014, Žvalgomieji tyrimai Neries slėnyje, tarp Dūkštų ir Čiobiškio / In: Archeologiniai tyrimai Lietuvoje 2013 metais, p. 105–120, Vilnius.
Vengalis, R., 2014, Tyrimai Kernavės senovės gyvenvietėje / In: Archeologiniai tyrimai Lietuvoje 2013 metais, p. 98–104, Vilnius.
Vengalis, R., 2015, Žvalgomieji tyrimai Ardiškyje / In: Archeologiniai tyrimai Lietuvoje 2014 metais, p. 68–71, Vilnius.
Vengalis, R., 2015, Žvalgomieji tyrimai Kernavės apylinkėse / In: Archeologiniai tyrimai Lietuvoje 2014 metais, p. 105–117, Vilnius.

Kernavė 1 site

Chronologically Kernavė 1 site is the earliest of the sites found in the area, most probably it dates to Final Palaeolithic. It was a small area on the first terrace above the floodplain, around 6–7 m above the river water level, where gravel – a rather early stratigraphic layer – has been unearthed due to ploughing. A bunch of flint artefacts made of the same flint nodule and covered with the same color patina were discovered on the surface.

The tool kit consisted only of three artefacts (Fig. 40), which were rather big implements used for scraping and cutting. The tools were produced from big flakes and made to be kept in one's hand without handles. Two scrapers and a cutting (?) tool could have been made by the same one person and most probably were utilized for working pieces of thick hide after a hunt. Whilst not much could be said about the flint knapping technology: it seems that the implements were produced somewhere else and brought to the site on the river Neris bank as no lithic debitage of the same nodule was found. However, no signs of the use of blade producing technology were determined, therefore it could only be reservedly assumed that these people (or one person) belonged to some archaeological culture related to Magdalenian tradition.

To sum up, Kernavė 1 site was probably one of few small sites in the river Neris basin, which could be ascribed to the most temporary ones as people have most likely stayed in situ for a very short term. It could also be presumed that a settlement of these people could be discovered somewhere nearby, as the small area on the river bank could have been visited only to accomplish some particular task.

Kernavė 2 site

Kernavė 2 site, though found only around 100 m away to the northwest from the previously described Kernavė 1 site (Map 32 (K)), was probably chronologically later and could be related to a different archaeological culture of flint knapping manner based on blade producing technology. Even though in the

Vengalis, R., 2016, Mitkiškių senovės gyvenvietė / In: Archeologiniai tyrimai Lietuvoje 2015 metais, p. 86–91, Vilnius.
Vėlius, G., Vengalis, R., 2016, Tyrimai Kernavės archeologinėje vietovėje / In: Archeologiniai tyrimai Lietuvoje 2015 metais, p. 141–148, Vilnius.

early 90s it was believed to be Neolithic[150], after some years the interpretation was revised and up until today the lithic finds assemblage found at the site was typologically ascribed to Mesolithic.

It would be considerable if the archaeological object of Kernavė 2a could be called a 'site' as there was only a deepened feature full of unused fragments of blades found in the sandy area (where a pine forest was grown in 30s) during a small scale excavation[151]. However, several test pits dug nearby have yielded a different lithic assemblage, which was interpreted as archaeological material of another stage of settling. Therefore the previously described concentration of blades was interpreted as a separate object named as Kernavė 2a (Map 32 (K)), which could typologically date to Final Palaeolithic–Early Mesolithic, whilst the later finds were attributed to a probably Neolithic site named Kernavė 2b (it was not analyzed in this study).

Kernavė 2a object was discovered on the first terrace of the river Neris, around 8 m above the water level. At that place a closest tributary running into the river was approximately 800 m away, in the northwest. Around 90–100 m to the north an elongated lake had previously existed, thus, the place was surrounded by water bodies. The site was in the sandy area and yielded a lot of flint artefacts, (in some places more than 70 per $1m^2$). The unearthed feature was of circular form, 70 cm width and 30 cm depth. Most probably it was a bit deepened. It contained more than 300 flints (mostly fragments of blades), some burnt bones and burnt pieces of a non-determined species of wood. Next to the feature a granite pebble with utilization marks was discovered. Some lithic implements were found as well: several scrapers, a burin, few microliths, fragmented cores.

The most important attribute of the fragmented blades assemblage found in the feature of Kernavė 2a was that the lithic material was all affected by high temperature, though not totally burnt to have changed the color into white and cracked. Whilst other finds – the burnt bones and pieces of wood – seemed to have been burnt stronger or longer. According to A. Luchtanas, who has

[150] Luchtanas, A., 1992, Kernavės pušyno prie Neries archeologiniai tyrinėjimai 1991 m. / In: Archeologiniai tyrinėjimai Lietuvoje 1990-1991 metais, Vilnius, p. 27–29.

[151] The same.

investigated the site, the deepened feature was not used for fire making as the sediment under it was not affected by fire[152]. Thus, assumedly the blades were produced and burnt/heated before they were put to a hole in the sand. It follows that these blanks were hidden, saved or someone got rid of them in that way. It would be still unclear why the material was burnt. Presumably, if the blades were produced near a fireplace and fragments unused for tool making were thrown in it, they could have been later shoveled to a particular place as rubbish. This interpretation could be also proved by the fact that the blade fragments have been mixed with ashes and some other burnt organic material, just as the contents of a fireplace would be.

The blade fragments from Kernavė 2a feature have been exposed under the glass in the Museum of Kernavė Archaeological Site, thus they could only be studied visually from a distance. However, some insights could still be done. Even if the official amount of the fragments was rather high – hundreds of pieces – it was obvious that a part of the assemblage would refit. Thus, the actual number of blades would then be lessened. Also, it seems that there were not only blade fragments found in the feature, but some flakes as well. The maximum width of the blades was around 2,8–3,0 cm, whilst a presumed length of the longest blanks would reach around 15 cm. Therefore, assumedly the cores used to produce those blades were rather big. Moreover, they were of a good quality flint, which could have been brought hundreds of kilometres from Southern Lithuania where flint mining places are known to have been situated.

As it could be seen from a distance, the blades were not retouched and had no marks of utilization. Also, after visual evaluation of the flint material used, it could be presumed that at least several different cores were knapped.

Blade depositions of dozens or even hundreds of blanks were known to be common in the Mesolithic Scandinavia, where they were interpreted as blade caches or even as blades saved to be used as knives in some ritual activities or ceremonies[153]. However, the deposition found in Kernavė was different at least

[152] Personal consultation with A. Luchtanas, 2017–10–27.

[153] Larsson, L., Sjöström, A., 2011, Bog sites and wetland settlement during the Mesolithic: Research from a bog in Central Scania, Southern Sweden / In: Archäologisches korrespondenzblatt, Vol. 41, p. 460–462.

in several characteristics: 1) blades were all fragmented, 2) they were affected by high temperature, 3) they were mixed with another archaeological material.

The function of Kernavė 2a archaeological object is still under discussion, primarily because a further excavation has not been done yet. However, after summing up all the characteristics of the feature, it could be considered as a non-accidental accumulation of tool producing waste, food refuse and some pieces of firewood, which has most likely been formed by a prehistoric man. Some further investigation of the area in the pine grove would probably be the most perspective for finding a preserved Stone Age settling horizon and would maybe allow archaeologists to clarify the function of Kernavė 2a object.

Kernavė 3 site

The third Stone Age site in Kernavė surroundings was discovered in 1989 by Aleksiejus Luchtanas and was later investigated for many years up until 2017. Unfortunately, it was overlaid by an Iron Age cemetery and settlement, thus the earliest archaeological horizon was barely preserved. An area of more than 2200 m^2 has been investigated during the excavations in the past three decades. Also several survey expeditions in the site surroundings yielded archaeological finds. The research until 2003 was initiated by A. Luchtanas and later was taken over by Rokas Vengalis. All the archaeological material was kept in the Museum of Kernavė Archaeological Site.

The site was situated on the right bank of the river Neris, on its second terrace above the floodplain (Map 32 (K)). It was a sandy area 6–8 m above river water level, around 80–170 m away from the river flow, on the right side of a small tributary Kernavėlė. Today it is a field, which was partly inhabited after the river Neris flood in 1931 (around 15 000 m^2 of the Stone Age site area).

As it was mentioned above, the Stone Age site overlaid with the Iron Age cemetery and settlement, which were of great importance for the archaeologists who have investigated the area. The eastern part of the site was inhabited since the early 30s. Unfortunately, the disturbance of later human activity has resulted in a nearly complete dissappearance of the earliest archaeological horizon, therefore, according to the investigators, only few features presumably dating to

Mesolithic have been identified. The only archaeological data which was suitable for the research on the first settling stage of the area were lithic artefacts and several features found during a large scale excavation in 1997. Two particular features No. 27 and 76 yielded lithics, they were ascribed to the earliest horizon and interpreted as Mesolithic huts by A. Luchtanas (Fig. 169).

As in many other sites along the river Neris, finds had mixed in the sand due to bioturbations and human activity. Thus, after analyzing their types and the flint knapping techniques used for blank production and implement formation, they were preliminary identified and divided into few separate assemblages. The division of lithic collection to at least two assemblages – Mesolithic and Neolithic/Bronze Age – was apparent as there were flint finds with a later re-retouch discovered, meaning that some of the earlier blanks or implements were reused after some time. In these cases also some insights on the flint knapping techniques used in the earlier stage could be determined: e. g. production of wide long semi-regular blades and formation of double-platform cores. Also there were some tools typical for one or the other period of settling, e.g. different types of points, which approved the site to have been at least two-staged.

The lithic assemblage contained various blanks: non-regular, semi-regular ant regular blades, also flakes. Therefore it could be assumed that at different stages of settling different flint knapping techniques were used. According to the flint implement typology, the site was most probably inhabited in Mesolithic and Neolithic, however, some flint tool production characteristics could be also related to an Early Mesolithic or even Final Palaeolithic (or both) settling stage.

The color of lithic artefacts should usually not be taken into account when talking about chronology. Yet in Kernavė 3 site some re-retouched blanks were indeed colored by a very strong patina comparing with the color of the negatives which were made later. Thus, on the basis of coloring, part of the assemblage could probably be related and be ascribed to Final Palaeolithic–Early Mesolithic.

The first inhabitants of the site had most probably used double-platform as well as unipolar cores (which could have been transformed from one form

into another). Significantly, almost all the cores were completely used, even though a big part of the flint assemblage implicates that prehistoric people had a very high quality flint material, probably brought from Southern Lithuania. Even if two early stages of settling were distinguished – a Final Palaeolithic and Early Mesolithic – it would be most likely that both groups of people had a good material for tool production and could form big cores for rather wide and long blade production. On the opposite, in the later times the local flint of poor quality was used. It might mean that Neolithic people had no material for making their implements, and therefore could have used the cores and blanks of their predecessors. That would explain why almost all the cores found at the site were completely used.

The lithic collection which could be ascribed to the Final Palaeolithic of Early Mesolithic inhabitants' kit was rich in tool types variety. The tanged points were all made of the same Late Swiderian technique, using semi regular and regular blades, and by retouching reverse side of the tang in order to make it slimmer and thinner. However, unlike in typical Swiderian technique, the reverse retouch was not used to get rid of the proximal end of the blade (the bulb), but was more likely used as a habitual technique for making a leaf-like point form. One of the arrows was even formed 'upside-down': by making the tang on the distal end of the blade (Fig. 42:1). The arrows were made of the blades produced from double-platform and unipolar cores. Typically, a marginal regular retouch was used to retouch the sides of the distal and proximal end of an implement, usually from the reverse side. Only one point stood out as being formed by retouching all the perimeter of the tool from the averse side, though the marginal type of retouch would still let to ascribe this point to a Late Swiderian kit.

The points found at Kernavė 3 site were interpreted as Kunda-Pulli type tools from the very beginning of the investigation[154]. However, some discrepancies with the typical Pulli type points were apparent:

[154] Luchtanas, A., 1998, Gyvenviečių ir kapinyno tyrinėjimai Kernavėje, Pajautos slėnyje, 1996 ir 1997 metais / In: Archeologiniai tyrinėjimai Lietuvoje 1996 ir 1997 metais, p. 82–86.

1) the points at Kernavė 3 site were of leaf form and had no tighten tang, which was very typical for Pulli arrows[155];

2) the marginal regular retouch used to form Kernavė 3 points was not common for Kunda culture, instead, a flat retouch (sometimes even applied on the whole surface) was used in this culture's technique;

3) there were no more typical Kunda implements (microliths and points) in the Kernavė 3 lithic assemblage;

4) differently from Late Swiderian, Kunda culture flint knapping technique was exclusively based on formation of unipolar cores and very regular blade production[156], while Kernavė 3 points were made of both – blades produced from unipolar as well as double-platform cores.

Some more similar points (as well as other implements) from Saleninkai 1 and 2, could be taken in comparison instead, and would rather show the resemblance to Late Swiderian culture. However, the relation to Kunda culture, though a bit more 'distant', could be also noticed, as the implements with marginal retouch were also common to Jara 1 site lithic assemblage, which was related to the typical Pulli point (Fig. 37). Therefore I would suggest interpreting the assemblage of Kernavė 3 site as Late Swiderian with some attributes of Kunda (or Resseta, or Butovo) culture.

The lithic collection of Kernavė 3 site contained an outstanding number of scrapers, whilst burins and other function implements were also numerous. Part of the assemblage was a bit different in the means of the way implements were made: using rather big blanks (both – flakes and blades), and spending not a lot of time for a precise forming of the tool. However, these tools were very convenient and could be used without handling. It could be presumed that this part of the assemblage could belong to Final Palaeolithic visitors and would implicate a rather short-term stay.

Most of the big scrapers with a wide working edge were made of

[155] Butrimas, A., Ostrauskas, T., 1999, Tanged point cultures in Lithuania / In: Tanged points cultures in Europe (eds. Kozłowski, S. K., Gurba, J., Zaliznyak, L. L.), Vol. 13, Lublin, p. 267–271.

[156] Sulgostowska, Z., 1999, Final Palaeolithic Masovian cycle and Mesolithic Kunda Culture Relations / In: Tanged Points Cultures in Europe (eds. Kozłowski, S. K., Gurba, J., Zaliznyak, L. L.), Vol. 13, Lublin, p. 86–92.

decortication flakes (Fig. 45–46). This point could be interpreted in both ways: the particular blanks could have been picked in that way accidentally or selectively. The latter interpretation could be argumented more, as the decortication flakes are usually the biggest and the thickest ones, and if some hard or big material had to be treated, people could have chosen those flakes to produce resistant implements for scraping. Moreover, they were rarely selected for making other tools.

Scrapers varied in size, thickness and form (Fig. 43–47). However, it must be admitted that part of the collection could probably be related to the later phase of settling, thus not all of the scrapers would reflect the actual variety of scraper types. Whilst some patterns could be distinguished, e.g. a number of scrapers were made of semi-regular blades and were retouched not only over the working edge, but by a marginal retouch applied on sides as well (Fig. 47). Typically those scrapers were retouched either on both sides or only on the right side. This kind of marginal retouching should be related to the convenience of the work or to the habitual technique, applied to form the implements. It was most probably not done for putting a handle on the tool. It might be that a blunter edge was formed for the implement in this way in order to keep the scraper in one's hand without a handle, and not to cut oneself. A particularly chosen right side for retouching might have also show which hand was used for scraping, most probably they belonged to a right-handed person (and vice versa). Whilst this reccurent manner of scraper forming should be also ascribed to the work of a same flint knapper or at least a relating group of people. The regular marginal retouching of implement edges (e.g. point edges, blade edges, etc.) seems to have been particularly characteristic to the Late Swiderian assemblage, therefore these scrapers could be interpreted as part of some Early Mesolithic kit, which belonged to one group of Kernavė 3 site inhabitants.

Burins found at the site were mostly made of fragmented blades, flakes and core correction flakes. The biggest part of them were used for one way cutting. Some of them had retouched sides, presumably, for the same reason as some of the scrapers – to make the tool convenient for keeping in one's hand.

Another interesting character of flint tool production, seen in Kernavė 3 site lithic collection – the retouching of a blank from the reverse side. Part of the assemblage could be distinguished by this manner of tool forming and probably be related. However, the chronology of implements on which this retouch was used would be hard to determine.

To sum up, the lithic assemblage found in Kernavė 3 site could be divided into two or even three collections, ascribed to Neolithic, Early Mesolithic and/or Final Palaeolithic. The variety of tool types showed that the main purposes of staying at the site in the earliest stages of settlement probably were hunting and the prey treatment. The tools were produced in situ, after bringing some flint material of a good quality. As the size of the same function implements varied and a lot of other cutting, drilling, peeling tools were also used at the site, it could be presumed that the first visitors have stayed at the site for quite a long time, prepared for the hunt and did a lot of prey treatment work afterwards.

The interpretation mentioned above could be also proved by other archaeological data – analysis of the prehistoric features discovered at the site. Some light brown and grey sand spots were identified during the excavation in 1997 (Fig. 126–128, 168). Several particular features No. 27 and 76 stood out and deserved more attention during the excavation. These two archaeological objects were unearthed in the same depth and were ascribed to the same stage of settling by scientists who have investigated the site.

Feature No. 27 was an almost circular brown and grey sand stain of around 2 m in diameter. It contained some flint artefacts, several stone pebbles and a small concentration of burnt bones in its northeastern part. The pit of the feature was 135 cm deep and had a bowl-form profile. The feature was affected by bioturbations, yet it could still be seen that greyish and brown sand sediments were kind of layered. Therefore it could be presumed that the object had functioned for some time and was filled (?) periodically. Greyish sediment lenses in the stratigraphy of the feature profile should most probably be related to some remains of organic material mixed with sand. The upper part of the stain was covered by a rather dark greyish brown sand cover. Moreover, a

narrow straight strip of clay was found on top. No signs of a fire/high temperature affect on sediment could be noticed within the limits of the feature No. 27 and around it.

The area where the Feature No. 27 was unearthed yielded many flint finds, the distribution of which unfortunately was not recorded in the excavation plan and could not be analyzed in a relation to the archaeological object. However, a small concentration of lithics and burnt bone fragments discovered inside the feature should be taken into account as an important detail in the reconstruction of the object function. The fragments of burnt bones might be interpreted as remains of some animal used for food, while their relation to flint flakes would be more difficult to explain. The only characteristic these artefacts had in common was that they could all be considered as prehistoric human activity waste. The concentration of lithics should probably not be interpreted as a particular object, instead it could be ascribed to one of the stratigraphic layers of sediment which filled the feature No. 27 and be explained as an accumulation of waste.

The characteristics depicted above do not lead to a conclusion that the feature No. 27 was a prehistoric hut. Moreover, a rather dark color of the upper part of the stain and the use of clay (for whatever reason it would be used) would most probably implicate a later dating of the feature than Early Mesolithic (this conclusion is being made on the basis of comparison with the Early and Middle Mesolithic features discovered in Pabartoniai and Dūkšteliai sites). It could be assumed that the deep and wide pit was used as a household installation where some organic material as well as some remains of waste were poured.

Feature No. 76 was a 2,9 x 2,3 m size, 60–70 cm thick deepened feature of a greyish-brown color sand (Fig. 127–128, 168). In comparison with the surrounding area, the place where the feature No. 76 was situated, many flint artefacts were discovered, therefore according to A. Luchtanas who was leading the excavation, they could be related to it.

Even though the feature No. 76 was disturbed by a later (most probably Iron Age) hole, it could still be analyzed. As it was seen from the profile

pictures, the feature was deepened and had a darker color bottom. It might be presumed that this dark grey color was the result of some organic remains mixing with the sediment. Thus, the deepened area might have been laid with some organic material – some plants, fur or skins. The size of feature No. 76 would fit a width of space needed to lie down and to live in. Lithic finds were found scattered due to bioturbations (they were also found in upper stratigraphic layers and even on the surface), however, most of them were still positioned within the limits of the feature area.

The characteristics of the feature No. 76 would lead to the interpretation that it was a prehistoric hut which could shelter at least two or three people. The organic material layer put on the bottom of it and the deepening of the hut would suggest that it was installed during a cool season, but not in winter, as it was previously suggested by A. Luchtanas[157] – probably in early spring or late autumn. This interpretation could be also proved by the fact that flint was knapped inside the hut, and some of the tools were used inside as well. Therefore it might be presumed that the activities which would rather take place outside were done inside, most probably due to unpleasant weather conditions. The installation should have been time consuming, therefore people who had built the hut presumably saw it reasonable to do it this way. Thus, it seems they had planned to stay at Kernavė 3 site for quite a long time. As it was mentioned before, the same insights could be done after studying the lithic assemblage.

However, even if some activities took place inside the hut, there were still some features 'outside' (Fig. 168). Several dozens of different features were also identified to the southeast from the hut. As it could be seen in the trench plan, all those features were distributed in between the 'hut' and feature No. 27. Five stains unearthed in A–D/4–8 square metres could be ascribed to one zone where some prehistoric settlement installation was set up, whilst other features could be interpreted as individual household objects of the settlement.

Flint tool types found within the limits of the hut – scrapers, burins, some

[157] Luchtanas, A., 1997, Kernavės senovės gyvenvietės (AR 1660) 1997 m. archeologinių tyrinėjimų ataskaita, Archive of the Lithuanian Institute of History, file No. 2956, Vilnius, p. 55.

microliths, a drill, an awl, fragments of blades and around 400 flakes – could lead to a presumption that the hut was more likely dated to the second half of Mesolithic. One scraper was with retouched sides and belonged to the tool kit which was described earlier in this section. A Late Swiderian point was discovered around 8 m away to the N/NE from the hut. However, a direct relation between feature No. 76 and the point should be considered reservedly.

To sum up, Kernavė 3 site could have been visited for the first time in Final Palaeolithic and/or Early Mesolithic by a group of people who had a short term stay (or several visits) related to some hunting activity. Later the site was occupied by Mesolithic settlers who were staying there for a bit longer and built a deepened hut as well as some other household installations. The latter settling stage yielded prehistoric features and lithic artefacts which could be attributed to one Mesolithic archaeological horizon. In total, an area of at least 200 m^2 was occupied. The biggest part of the lithic assemblage found at the site should be ascribed to Mesolithic, whilst undoubtedly it was visited once again in Neolithic or Bronze Age. However, some of the earlier settlers' assemblage might be lost and could not be taken into account because Neolithic people could have used it as material for tool production. Whilst in general lithic assemblages of all the stages of site settling had mixed due to various factors, basically it was due to human activity in the last two thousands of years.

Liaukiškiai site

The site was discovered on the right bank of the river Neris in 2014 by R. Vengalis[158]. It was situated around 130–140 m to the north–northwest from the river flow, on its second terrace, approximately 5 m above present river water level (Map 31 (J)). During a survey expedition an intensively patinated double-platform flint core, a blade and a flake were collected. They were preliminary dated to Final Palaeolithic. However, no further interpretation could be done until a larger scale investigation was undertaken.

[158] Vengalis, R., 2015, Žvalgomieji tyrimai Kernavės apylinkėse / In: Archaeologiniai tyrinėjimai Lietuvoje 2014 metais, Vilnius, p. 105–117.

Mitkiškės 2 site

The site was discovered in the early 20s by P. Tarasenka[159]. It was one of two places on the left bank of the river Neris in Mitkiškės village yielding flint artifacts (Mitkiškės 1 and 2). Assumedly Mitkiškės 2 site was situated on the left bank of a small tributary, Sukra, at the point where the wide valley of the river Neris reaches high terraces and a big sandy plateau (Map 32 (K)). It could have been located approximately 15–16 m above the river Neris water level, around 880–900 m away from its intersection with the creek. The place yielded some flint artefacts laying on the surface.

Another Stone Age site – Mitkiškės 1 – was situated nearby, a bit closer to the river Neris flow[160]. It seems that the same place was overlayed by Iron Age cemetery[161], therefore at first some stone structures and inhumation remains unearthed in the same area (Fig. 129) were interpreted as a Stone Age grave[162]. On the basis of lithic assemblage typology the latter site should be ascribed to Neolithic or Bronze Age, therefore it was not included in this study.

Mitkiškės village was visited in 1938 and 1949 by K. Jablonskis, who also collected a small lithic assemblage dating to Final Palaeolithic–Early Mesolithic and Neolithic. Unfortunately, the collection of artefacts from Mitkiškės village was kept in one place and was not divided into two separate Mitkiškės 1 and 2 site assemblages[163]. Therefore only the typologically earlier lithics were taken into consideration for this study.

The small lithic assemblage should be typologically divided into several separate collections, one dating to Final Palaeolithic–Early Mesolithic and another to Neolithic as several flint points typical to these two periods were discovered at the site. The earlier one should be related to Late Swiderian culture, whilst also a probable fragment of a bit different point was found. Not typical for Swiderian technology, it was retouched only from the frontal side (Fig. 53:2). Thus, it could

[159] Tarasenka, P., 1922, Ieškojimai neries ir Šventosios santeklyje / In: Mūsų senovė, Vol. 1, book No. 4–5, p. 587.
Tarasenka, P., 1924, Panerio pirmykštės kultūros sėdybos (nuo Kernavės iki Kauno) / In: Kultūra, No. 7–8, p. 301–308.

[160] Rimantienė, R., 1974, Akmens amžiaus paminklai / In: Lietuvos TSR archeologijos atlasas. Akmens ir žalvario amžiaus paminklai, Vol. I, LTSR Mokslų akademijos istorijos institutas, Vilnius, p. 56, depiction No. 194.

[161] Tarasenka, P., 1922, Ieškojimai Neries ir Šventosios santeklyje / In: Mūsų senovė, Vol. 1, book No. 4–5, p. 587.

[162] Tarasenka, P., 1925, Gimtoji senovė. Ieškojimas, pažinimas, apsaugojimas, p. 20.

[163] K. Jablonskis collection of archaeological finds (1938–1949), National Museum of Lithuania, Vilnius.

be reservedly interpreted as close to Ahrensburgian type.

The Swiderian point (Fig. 53:1) was made of a semi-regular blade. Remarkably, the arrow tip was formed on the proximal end of the blank. As the flat retouch on the reverse side is usually considered as proximal end (bulb) flattening technique, in this case, it seems it was used simply following an accustomed manner of arrow making and forming a very regular tang. Therefore, it might be presumed that the arrow was made not in a hurry, but was prepared beforehand. It is worth mentioning that the use of a similar technique could be observed on both points discovered at the site – their tangs were formed on the distal end of a blank. These few lithic implements might let to reservedly discuss a hypothesis if Swiderian and Ahrensburgian types of arrows could have been used by the same group of people.

Some other implements formed from semi regular blades were of non-determined function, but could have been used for cutting. It is important to note that no tools for hide treatment were recorded, thus, the site might be interpreted as particularly related to hunting. Most likely it was abandoned just after the hunt process was finished.

The Final Palaeolithic flint debitage was not numerous, yet as several double-platform flint cores were discovered in the area (see section *'Mitkiškės 3A site'*), it might be presumed that some flint knapping activity took place somewhere around. However, there is a possibility that the two places might have been occupied in a diffent time and had nothing in common.

Mitkiškės 2 site should be most likely interpreted as a Final Palaeolithic–Early Mesolithic short-term stay campsite related to hunting. It might be presumed that it could still be investigated archaeologically in the future and provide more information about the Final Palaeolithic settlement.

Mitkiškės 3 site

Throughout the years Sukra river surroundings in Mitkiškės village were also interesting for archaeologists of other periods as an Iron Age cemetery was situated nearby. The right bank of this small creek was visited in 2010 (no

results[164]), also in 2015, when, despite other artefacts, a few flint blanks and a retouched blade produced from a double-platform core were discovered on the surface[165], and in 2016, when two double-platform cores as well as some other lithics were found in the soil[166]. Following the original numeration of the sites recorded in Mitkiškės village, it should have been titled as 'Mitkiškės 3 site' (Map 32 (K)). In this research two separate places – A and B – were distinguished as yielding flint artifacts. Mitkiškės 3A find place was situated a bit higher, on the second river terrace, approximately 12 m above the present water level, around 360–370 m away from the Neris flow. Some double-platform cores and blades were discovered there on the surface. As at least several flint cores were used to produce blades, it might be presumed that there should have been a quite big assemblage of lithic implements made.

According to the lithic assemblage typology, Mitkiškės 3B find place was most probably occupied in later periods than Early Mesolithic, therefore it was not taken into consideration for this study.

Neravai site

A site in Neravai village was discovered in 2008 during a rescue survey organized by R. Nemickienė and A. Merkevičius[167]. It was located on the left bank of the river Neris, on its second terrace above the floodplain, on the right bank of a tributary Vokė (Map 36 (O)). It was around 115 m away to the northeast from the river Vokė, and about 530–560 m to the south–southwest from the river Neris, in a place where the two rivers run very close to each other. However, it could be presumed that the tributary flow was a bit further to the northeast, so the prehistoric site could have been originally situated much closer to it, only dozens of metres away.

In 2009–2010 the site was excavated by E. Šatavičius[168]. An area of around

[164] Vėlius, G., 2011, Neįtvirtintos gyvenvietės prie Neries / In: Archeologiniai tyrinėjimai Lietuvoje 2010 metais, Vilnius, p. 92.

[165] Vengalis, R., 2016, Mitkiškių senovės gyvenvietė / In: Archeologiniai tyrimai Lietuvoje 2015 metais, Vilnius, p. 90, Fig. 4.

[166] Vengalis, R., 2017, Kernavės apylinkių žvalgymai / In: Archeologiniai tyrinėjimai Lietuvoje 2016 metais, Vilnius, p. 458–465.

[167] Nemickienė, R., Merkevičius, A., 2009, Kelio ties Grigiškėmis žvalgomieji tyrinėjimai / In: Archeologiniai tyrinėjimai Lietuvoje 2008 metais, Vilnius, p. 22–23.

[168] Šatavičius, E., 2011, Neravų senovės gyvenvietės tyrimai 2009–2010 metais / In: Archeologiniai tyrinėjimai Lietuvoje 2010 metais, Vilnius, p. 25–33.

450 m^2 has been investigated, however, according to the archaeologist, the site could have been of 5 ha size, and unfortunatelly some part of it was destroyed due to a highway building activity.

The lithic assemblage of around 7800 finds was recorded in two stratigraphic layers: yellow small grained sand and the ground layer of white small grained to silty sand. As the collection was not available for a closer investigation, all the interpretations given in this study were done on the basis of published information[169].

According to E. Šatavičius, around 8% of lithic assemblage was affected by high temperature. Some finds were quite intensively patinated. The flint material used at the site was of a good quality, most probably brought from some raw material sources situated somewhere in the close surroundings of the river valley. More than 70 cores were discovered during the excavation. They were of various forms: double-platform, unipolar, and of some other forms. Some knapped flint pebbles were also present, therefore it might be presumed that prehistoric people have tried to form some cores from the flint material found locally, around the site.

The site yielded a number of different types of flint tools, mostly they were related to some hunting and fishing activity. There were around 10 presumed points and their fragments. As it could be seen from published pictures, two of them were with tightened tangs and tips formed by marginal retouch from the dorsal side (Fig. 139). Their length was very different, as one was almost twice as shorter.

The collection of flint tools also contained 54 end-scrapers and 30 burins, as well as one burin combined with a scraper. Although the number of these implements was quite big, only part of this assemblage should be ascribed to the first stage of site settling as, according to E. Šatavičius, the earliest finds horizon was overlayed by a Mesolithic settlement. The same could be said about other tools present at the site: a drill, more than 40 implements of non-

[169] Šatavičius, E., 2011, Neravų senovės gyvenvietės tyrimai 2009–2010 metais / In: Archeologiniai tyrinėjimai Lietuvoje 2010 metais, Vilnius, p. 25–33. Šatavičius, E., Marcinkevičiūtė, E., 2012, The excavation of Neravai ancient settlement / In: Archaeological Investigations in Independent Lithuania (1990-2010). Vilnius, p. 35–39.

determined function, and several cutting implements (axes?).

As there were dozens of knapped non-flint rock artefacts found, mostly flakes, it was also assumed that some other rocks – sandstone, granite and quartzite – were used at the site in Stone Age. However, it would be difficult to determine if they belonged to the Final Palaeolithic horizon.

The first settlers of Neravai site were a group of people who were using Swiderian technology for tool making. Although no AMS ^{14}C dating was yet published, it was not clear if any of the prehistoric features unearthed at the site could be related to Final Palaeolithic. Yet, according to E. Šatavičius, who has excavated the site, most probably one of the features could be interpreted as a hut and should be ascribed to the earliest stage of site settling. It was a 3–4 m wide stain with one large granite boulder and some smaller ones, most probably used as part of the hut construction (Fig. 131–135). As it could be seen from the profile, the feature was recessed at least by a few dozen centimetres. It was also assumed that a hearth was installed inside the hut.

The next settling stage was related to Mesolithic Kunda culture on the basis of the typology of the flint artefacts. Moreover, in a relation to the finds distribution two prehistoric structures were identified as remains of two huts which were preliminarily dated to Mesolithic. One of them was also a recessed type of structure (Fig. 130). As it was seen from a very dense distribution of lithics, most probably inside the hut some flint knapping activity took place. All these characteristics would lead to an interpretation that a hut was built and inhabited in the cool period of the year. The second Mesolithic hut was partly destroyed by highway building, yet in the preserved part some remains of a hearth were unearthed, as well as accumulation of burnt bone fragments along the presumed limits of the hut 'wall' was recorded.

Due to the good conditions of preservation some other prehistoric features were also discovered at the site. Several features were filled with organic unburnt material (Fig. 136–138). An interpretation of these features was suggested by E. Šatavičius. According to the archaeologist, it could have been latrine-like refuse pits which were dug for pouring some organic waste, and used

as toilets as well. However, as no further investigation on these prehistoric features was done, all the interpretations should be considered reservedly.

Pabartoniai 1 site

The site was situated in Pabartoniai village, on the second terrace above the floodplain on the right bank of the river Neris, around 290–310 m to the north from the river Neris flow, approximately 10 m above the water level, near a small tributary called Želmena (Maps 25 (D) and 26 (E)). The first small collection of retouched flint artefacts was collected from the sandy surface more than 70 years ago by academician K. Jablonskis and his daughter R. Jablonskytė [170]. Both then and the following decades all the lithic assemblage was interpreted as Neolithic, yet the small list of the artefacts identified – epi-Swiderian points, microliths, a scraper, a flint striker and a fragment of a polished stone axe – had already implicated that some finds of different periods had mixed[171]. The site was approved as Swiderian in the last decades of the 20th century and was later included in the scientific literature that overviewed Lithuanian Final Palaeolithic archaeology[172].

The area was surveyed for several times, but almost no additional archaeological material was found[173]. Therefore Pabartoniai 1 site was erased form the Lithuanian protected heritage objects list[174]. It was relocated when new scientific research was initiated in 2014. A detailed investigation of 100 m^2 trench has been carried out[175]. In this study the archaeological data available in the National Museum of Lithuania and the lately excavated material was investigated.

[170] Jablonskis, K., 1947, 1947 metai (Slownik), Survey diary, Archive of the Lithuanian National Museum, Department of Archaeology, Vilnius.

[171] Rimantienė, R., 1974, Akmens amžiaus paminklai / In: Lietuvos TSR archeologijos atlasas. Akmens ir žalvario amžiaus paminklai, Vol. I, LTSR Mokslų akademijos istorijos institutas, Vilnius, Vol. 1, p. 60, depiction No. 225.

[172] Girininkas, A., 2009, Lietuvos archeologija: Akmens amžius, Vilnius, Vol. 1, p. 59, Fig. A.

[173] Brazaitis, Dž., 2004, Pabartonių akmens amžiaus gyvenvietės (AR 212) žvalgomųjų tyrinėjimų ataskaita, Library of Lithuanian Institute of History, Archive 1, file No. 4185.
Brazaitis, Dž., 2004, Archeologiniai tyrinėjimai Lietuvoje 2003 metais, p. 310, Table 1, Vilnius.
Žalnierius, A., 1996, Artezinio gręžinio vietos žvalgomųjų archeologinių tyrimų ataskaita, Kaunas, Library of Lithuanian Institute of History, file No. 2722, p. 1–9.

[174] Gudaitienė, G., 2016, Archeologinis paveldas Pabartoniuose: rasti keliskart atrastą (part I) / In: Taurosta, No. 1 (2), Kaišiadorys, p. 118–122.

[175] Gudaitienė, G., 2015, Pabartonių akmens amžiaus gyvenvietė / In: Archeologiniai tyrinėjimai Lietuvoje 2014 metais, Vilnius, p. 32–38.
Gudaitienė, G., 2016, Pabartonių akmens amžiaus gyvenvietės I ir II / In: Archeologiniai tyrinėjimai Lietuvoje 2015 metais, Vilnius, p. 26–31.
Gudaitienė, G., 2017, Pabartonių akmens amžiaus gyvenvietė I / In: Archeologiniai tyrinėjimai Lietuvoje 2016 metais, Vilnius, p. 26–31.
Gudaitienė, G., 2016, Rediscovering the Final Palaeolithic–Mesolithic at Pabartoniai, a site on the River Neris / In: Archaeologia Lituana, Vol. 17, Vilnius, p. 35–56.

After analyzing the deepest stratigraphic layers of the site (Fig. 140) – a Stone Age finds horizon – it was assumed that the river Neris terrace where Pabartoniai site was situated most likely formed in the very end of the Pleistocene as a gravel/sand shore of the river. Back then the third terrace of around 20 m height had already existed 120–330 m away from the shoreline, in the NW. During the river floods the terrace was constantly supplemented with silt and very fine grained sand. Aeolian processes have also had an influence in the formation of the postglacial ~20–30 cm thick light yellow-white fine grained silty sand layer, which is visible in the trench profile. Presumably people could have come to this area by the very end of the Younger Dryas or in Preboreal: some Final Palaeolithic and Early Mesolithic sites along the river Neris were found on a lower terrace, thus it might be assumed that it had formed earlier than in Preboreal. The site could have been a few hundred metres away from the river bank, more or less in the same place as it is today. Therefore, it may be presumed that the river Neris level at the time Pabartoniai was first settled could have also been similar.

Later the archaeological remains of the first settlers of this region were covered by sand due to the post-depositional, mostly Aeolian processes. While the first terrace sand has drifted to and fro, various bioturbations had moved the artefacts in the ground. As different groups of people had come to settle this place in Mesolithic and Neolithic, the archaeological material of various settlement stages had mixed and shifted vertically as well as horizontally. The Aeolian processes continued, and the yellow fine grained sand and light brown sand layers formed another 30 cm thick stratigraphic layer.

At the point where Pabartoniai archaeological site is located the river extent reaches 130 m in width, whilst the second terrace is covered with a pine tree forest.

In the 100 m^2 area unearthed during the excavation, more than thirty different features related to Stone Age–Bronze Age horizon have been uncovered. Throughout three years of excavation it became clear, that the most intensively inhabited area – the so called ‘central part’ of the settlement – has

been already located, while a big part of periphery area to the north was also investigated[176] (Fig. 169).

The majority of the archaeological objects were unearthed in a 70–120 cm depth, where light brown small grained sand had switched to the yellow fine grained sand. The difference between the points where the objects were uncovered (or the 'top elevations' of the features) was quite slight. Nevertheless, the following insights were taken into consideration when analyzing and comparing the archaeological data:

- First of all, the higher the feature top was, the more intense/darker was its color.
- Taphonomically the darker colored stains found in upper layers were related to later period than those, which appeared lower, had lighter color and a more blurred outline. The presumption was later approved by AMS ^{14}C dating: feature No. 9 (of light grey color) was dated to Middle Mesolithic whereas feature No. 6 (of very dark grey/black color) was dated to Neolithic (Fig. 141).
- The stains of a more intense color have vanished relatively higher (some of them even higher than other objects have started to appear). This feature has shown that at least few separate stages of settling were evident.

Even though the upper stratigraphic layer of features could have been disregarded as not belonging to the earliest settlers, there were still more than a dozen objects unearthed deeper. These objects could have been either connected and be of the same chronology, or some separate archaeological horizons could have been distinguished. The features found in the lowest layers were all of the same color intensity and reached the deepest bottom ground – white small-grained sand with limonite inclusions – sometimes even intervening into it. Thus, these objects were ascribed as most likely related to the earliest stage of the site settlement.

[176] Gudaitienė, G., 2015, Pabartonių akmens amžiaus gyvenvietė / In: Archeologiniai tyrinėjimai Lietuvoje 2014 metais, Vilnius, p. 32–38. Gudaitienė, G., 2016, Pabartonių akmens amžiaus gyvenvietės I ir II / In: Archeologiniai tyrinėjimai Lietuvoje 2015 metais, Vilnius, p. 26–31. Gudaitienė, G., 2017, Pabartonių akmens amžiaus gyvenvietė I / In: Archeologiniai tyrinėjimai Lietuvoje 2016 metais, Vilnius, p. 26–31.

The archaeological objects differed in size and form, their outline was usually hard to define. In the process of excavating the form of most of them had slightly changed from oval or circle to formless, or vice versa. Some of them were fragmented and consisted of several segments. It could have been a result of post-depositional processes, mostly bioturbations. Several features seemed to have been recessed into the ground.

Only a few features containing stone pebbles/boulders were unearthed, yet in most cases they were related to the darker or more intense color stains unearthed a bit higher, therefore they were taphonomically dated to later phases of site occupation (Neolithic and later). Also some individual stone pebbles and little boulders were uncovered. One of them – a sandstone core with fitting flakes – was related to a grey color sediment stain (feature No. 10d) in which it was found (Fig. 142). This stain was unearthed in the lowest stratigraphic layer and was dated by AMS ^{14}C dating to Middle Mesolithic (Table 5). Thus, the knapped pebble was relatively dated to the same period.

The AMS ^{14}C dating method was applied for samples taken from nine archaeological objects that were unearthed in the deepest layers in Pabartoniai 1 site: features No. 2, 6, 8, 9, 10d, 20, 24, 25, and 30. The results have revealed that the site was settled several times in Mesolithic and in Neolithic (Table 5). At least three stages of site occupation were distinguished. As it could be visible from the site plan and feature distribution, the remains of several settling horizons had overlaid (Fig. 169–171).

At first the earliest horizon was presumed to have reached back to Middle Mesolithic. Features No. 8 and 9 were related to one stage of site occupation in approximately 7 500–7 600 cal BC[177]. Whereas feature No. 10d was of disputable dating: according to the AMS ^{14}C results, it could have been either related to this stage, or could have been even earlier (Table 5). In addition, there was also one charcoal fragment picked close to the feature No. 30 the dating results of which did not match with the ones collected from the centre of

[177] Gudaitienė, G., 2016, Rediscovering the Final Palaeolithic–Mesolithic at Pabartoniai, a site on the River Neris / In: Archaeologia Lituana, Vol. 17, Vilnius, p. 35–56.

the feature No. 30. It was much earlier, and therefore was interpreted as assumedly linking to the same old site settling horizon to which the feature No. 10d could be ascribed. The distance between those two samples was approximately 4 metres. To sum up, the feature No. 10d and one random charcoal taken from the lowest layers had shown that maybe some activity could have taken place at the site at some point in between 7942–7831 cal BC. Presumably, this stage might be interpreted as the very first period of site occupation.

The feature No. 10d contained an end-scraper made of a crested blade that was probably produced from a double-platform core. Therefore it was not related to the unipolar core use and regular blade production technology recorded in the area around features No. 8 and 9. Within the limits of the feature No. 10d stain a sandstone core and some flakes fitting it were uncovered. A very similar assemblage of knapped sandstone was also found 5 metres away, around the feature No. 25. Thus, these two features were directly related. It was presumed that they both were of the same chronology and belong to the first stage of site occupation. In addition, both features were unearthed in the deepest stratigraphical layer. Two samples of the feature No. 25 were dated and due to a mismatch of the results were later repeatedly investigated. One of the samples was regarded as probably contaminated, because the two dates made of it did not overlap. Yet another sample was dated to approximatelly 7580 cal BC with a probability to also be a bit younger and reach up to 7900 cal BC. Thus, a very slight chance that the dating results of the features No. 10d, 25 and a charcoal piece found close to the feature No. 30 could be related to the same chronological stage was seen. If this presumption was proved, a stage of ~7900–7800 cal BC could be regarded as the earliest stage recorded in Pabartoniai 1 site.

It has to be noted that in the closest vicinity of the features No. 10d and 25 two flint burins, few retouched blades, a residue of double-platform core and some blanks produced from a double-platform core were discovered. In general, on the basis of lithic typology and flint working technique some artefacts found

at the site were ascribed to a different archaeological culture than the one recorded around features No. 8 and 9 (second stage of site settling): it was rather related to the use of double-platform cores and the production of non-regular and semi-regular blades than to the unipolar flint knapping technique and production of very regular blades. Products of double-platform core working were ascribed to the earliest stage of site occupation. Some scrapers, burins and scrapers combined with burins were related to it (Fig. 55 and 60:1, 19). One of the most typical finds were tanged flint points of Late Swiderian type (Fig. 54). They implicate that this archaeological culture was the first to appear in Pabartoniai 1 site. However, it would be questionable if all the assemblage related to the use of double-platform cores may be related to the previously described chronological stage which falls into Boreal period, as Late Swiderian culture is usually dated to Preboreal at the latest and is known to have ended in Early Mesolithic. Presumably, a later dating of this archaeological culture might be possible and should be considered.

The third stage of site settling was not a lot later than the second one. Two features – No. 20 and 30 – were dated to approximately 7300–7000 cal BC (Table 5) and indicated another site occupation stage in Middle Mesolithic. In this case feature No. 8 was of considerable dating as it could have been ascribed either to the second or to the third stage.

The date of feature No. 2 (6659–6475 cal BC) has stood out from the rest of the dating results. The sample might have been contaminated, therefore only a repeated investigation of the samples taken from the feature stain will reveal if it shows a fourth stage of site occupation, or if another interpretation has to be suggested. The function of this feature was also taken under discussion (see further).

The most recent stage of the site occupation in Stone Age was dated to Neolithic. Several features of a much darker color unearthed in the yellow fine grained sand layer (relatively higher) were typologically ascribed to Neolithic or Bronze Age. One feature No. 6 was dated by AMS ^{14}C dating in order to check this presumption. The results have approved that the site was once again

visited by people in 4319–4041 cal BC. Another feature No. 24, which was supposed to have been of earlier dating, was also dated to Neolithic, 4230–3969 cal BC. Thus, if taking the average of both datings, it could be presumed that the fifth stage of site settling was at some point in between 4230–4041 cal BC. However, this period was out of concern for this study.

A spatial distribution of flint artefacts and burnt bone fragments was done by filtering the archaeological data in many different criteria. After sorting the finds by their absolute level into several layers (deeper than 90 cm; 80 cm; 70 cm; 60 cm) basic concentrations around the features dating to Middle Mesolithic were distinguished. It was evident that features No. 8, 9, 25, and 30 were the most important and implicated several activity zones. To compare, feature No. 10d stood out as not relating to any accumulation of lithics or burnt bones, yet it yielded an end-scraper made of a crested blade (Fig. 60:20) and a flaked sandstone pebble (Fig. 142). Whereas feature No. 9 was related to the concentration of burnt hazelnut shells on the basis of radiocarbon dates obtained (Table 5). A few hundred of these organic artefacts were collected to the east from it, yet were also relatively close to the segmented feature No. 10. The content of the feature was greyish sand mixed with charcoal and ashes. However, if compared to the hazelnut-related features investigated in other sites in Europe[178], it would be difficult to interpret it as a hazelnut roasting place, because the nut shells were beyond the limits of the feature No. 9 stain. Thus, the area was considered as an eating zone.

Five flint knapping zones were distinguished on the basis of flint debitage accumulations and the distribution of cores and core correction flakes (Fig. 169). Three of them were related to the Middle Mesolithic features No. 8, 9 and 30. All five zones yielded many fragmented blades, mostly regular. Also completely used double-platform cores and blades produced by bi-directional knapping were found all over the area, especially in the flint knapping zones No. 2, 3 and

[178] Holst, D., 2007, Subsistenz und Landschaftsnutzung im Frühmesolithikum: Nussröstplätze am Duvensee / Doctoral dissertation, University of Johannes Gutenberg, Mainz.
McComb, A. M. G., 2009, The ecology of hazel (Corylus avelana) nuts in Mesolithic Ireland / In: Mesolithic Horizons. Papers Presented at the Seventh International Conference on the Mesolithic in Europe, Belfast 2005 (*eds.* McCartan, S. B., Schulting, R., Warren, G., Woodman, P.), Vol. 1, p. 225–231.

4. The refitting analysis will clarify the use of flint knapping techniques in separate zones, yet as it was mentioned before, a larger area has to be excavated before a proper amount of blanks was collected to apply this method.

There were many archaeological features of considerable dating. However, the number of samples given for the AMS ^{14}C dating investigation for this study was limited. Only features unearthed in the lowest horizon were chosen to be analyzed. Whilst the ones discovered relatively higher, in the brown fine grained sand layer, and containing almost no flint artefacts were not yet investigated. In some places of the excavated area archaeological features actually overlaid, thus the ones found in higher horizon were interpreted as chronologically later.

One of the objects – feature No. 2 – stood out by all means: AMS ^{14}C dating, its form and depth, as well as archaeological finds discovered around it and within its limits. It was unearthed in the lowest white fine grained sand layer and most likely was recessed into the ground by almost 60 centimetres (Fig. 144a–f, 145). The filling of the feature was mixed with small charcoal pieces, one of which was dated to 6659–6475 cal BC. The charcoal fragments were all smaller than 10 mm, it might have been the result of a controlled fire made by humans who took care of burning fuel by shoving unburnt bigger pieces to the fire center[179]. This presumption has led to the interpretation that the feature was a prehistoric hearth. While in the central part of it a thin reddish lens of sediment mixed with ochre was uncovered. The only artefacts attributed to the feature were a Late Swiderian point (unburnt) (Fig. 54:1), a semi regular blade produced from a double-platform core (unburnt) and a small piece of ochre. The interpretations of this archaeological object could vary (see section '*Rituals'*). Yet if interpreted separately from the feature No. 2, the two flint artefacts mentioned above would typologically be ascribed to Early Mesolithic.

The sparse distribution of burnt lithics in all the excavated area when taking

[179] Personal consultation with Dr. H. Kroll and Prof. Dr. W. Kirleis (Christian-Albrechts-University Kiel, Institute of Prehistoric and Protohistoric Archaeology).

all the levels in consideration implicated that a big part of them could have been affected by fire due to post-depositional processes, e.g. a natural burning of the plant cover some time later after the site was abandoned. However, if only the deepest level was analyzed, some burnt flint concentrations could be visible around the features No. 8 and 30, as well as in the flint knapping zone No. 3 (Fig. 171). The same two features were also distinguished as concentrating the burnt bone fragments. Thus, most likely they could be interpreted as particular spots at the Mesolithic site where some activity connected with fire making had taken place. Also one additional feature No. 24 dated to Neolithic yielded numerous fragments of burnt bones. That concentration was seen in a higher level compared to the previously described ones. It was unearthed in the yellow fine grained sand, which was concerned as Neolithic horizon.

The distribution of flint tools was also informative only when taking the archaeological data from the deepest layers into account (notwithstanding the fact that a big part of Mesolithic implements were shifted vertically by several dozen centimetres or even more). The analysis has shown that the main area of activity was in the central and southern part of the excavated trench (Fig. 171). This data matched with the previously described insights – the most outstanding features No. 8, 9 and 30 as well as flint knapping zone No. 3 were surrounded by many flint tools and their fragments. However, artefacts found in the yellow fine grained sand layer could have been of various dating. It seems that three Mesolithic campsites overlapped almost at exactly the same place. Perhaps further excavation would provide an opportunity to determine where the preliminary limits of each of the site occupation areas were. Yet after analyzing the distribution of tools that were particularly typical to Early Mesolithic – scrapers combined with burins, tools made of blanks produced from double-platform cores, scrapers with the working edge formed on the proximal end, etc., – an area in the western part of the trench stood out. It yielded a bigger number of those artefacts and might have shown an approximate place of the the earliest settlement central activity zone, which could not have been visible when investigating the archaeological data from other perspectives.

Typologically most of the flint artefacts were dated to Mesolithic, and these statistics correlated with the site occupation reconstruction described above. Middle Mesolithic finds were made basically from regular blades produced from unipolar cores. The distribution of these blanks had also matched the presumed view of Middle Mesolithic horizon: they were found around the features No. 8, 9, 30 and 26, as well as in all the flint knapping zones.

Finds implicating Neolithic stage of site settling were very few: some potsherds, a piece of a polished stone axe and flint tools made on flakes. Also some of the microliths might be ascribed to this collection.

As it could be reconstructed from the negatives of the flint implements from the earliest inhabitants' tool kit, double-platform cores were formed for blade production. Yet the implements were made from various blanks, even from the core correction flakes. Flint debitage that remained from double-platform core knapping was not numerous. Thus, on the basis of the archaeological data excavated up until today, it might be presumed that only several nodules of a good quality flint were brought to the side during the very first visit. However, further investigation of the site might reveal that there was some double-platform core flint knapping zone yielding larger amounts of lithic debitage. It has to be noted that also unipolar flintknapping technique could have been used during the first stage of site setting, as regular blade knapping technology and the use of unipolar cores were common features not only in Middle Mesolithic, but in the Late Swiderian period as well[180].

Flint implements produced on decortication flakes were not numerous, thus assumedly the first visitors of Pabartoniai 1 site most probably had access to some sources of good quality flint material and may have brought some partly prepared cores to the site. The place where Pabartoniai 1 site was located was on the northern border of the flinty zone of Southern Lithuania, a few dozen kilometres away from the flint mining sites[181]. However, the site itself was

[180] Зализняк Л. Л. 1989. Охотники на северного оленья Украинского Полесья зпохи финального палеолита, Киев.
Šatavičius, E., 2016, The First Palaeolithic Inhabitants and the Mesolithic in Lithuanian Territory / In: A Hundred Years of Archaeological Discoveries in Lithuania, Vilnius, p. 21.

[181] Rimantienė, R., 1984, Akmens amžius Lietuvoje. Vilnius, p. 42.

situated in a non-flinty area. The blanks used for point production were of very good quality and might also implicate that some of these tools were not made in situ, but were prepared in advance and brought to the site instead. In general, all the flint finds recorded were of good to very good quality material. However, that should not mean that some flint mining had taken place somewhere nearby, as all the flint nodules found in the surrounding area (in the gravel mining places as well as on the surface) were of very poor quality: the pebbles were small and had a lot of chalky inclusions. Only one case of working a little local pebble of flint was recorded at the site, however, after several trial strikes it was thrown away.

The lithic assemblages of the second and the third settling stages could not be clearly discerned. Typologically those were the finds made on regular blades produced from unipolar cores: microliths, retouched bladelets, some end-scrapers and other finds. (Fig. 57, 58, 60). On the basis of the proportioning of the flint assemblages of various periods, an interpretation might be suggested that Middle Mesolithic people had stayed here for the longest period of time. While the number of remained archaeological features showed that also Neolithic stage of settling should have lasted for quite a long time. During the later stages of site occupation artefacts of the first visitors were scattered all around the sandy area and therefore became less 'visible'.

To sum up, Pabartoniai 1 site was chosen by Late Swiderian people as a short-term campsite. It might have been a strategic decision to settle very close to the tributary, on its terrace 4 m above the small river. Although the sides of the small river Želmena terraces were generally steep, the site was situated near a slope where the water could be more conveniently accessed.

Most likely the first inhabitants had stayed at the site not for a long time and had some hunted prey treatment done. As it could be seen from the archaeological data excavated up until today (that could approximately be 40–50% of the site area), the features ascribed to that stage of site settling were very few. They might have been greyish stains that contained ashes, some charcoal, a few flint tools and debitage of knapped sandstones. Having in mind

the good quality of flint material used, the selection to work sandstone should be regarded as very interesting: this type of material must have been taken not due to the lack of flint, but for some other reason. Supposedly, the further investigation of this archaeological object could let to interpret the primary horizon of site occupation and uncover some archaeological material which could support or disprove the presumptions written above.

Pabartoniai 2 site

The site was discovered during the same survey expeditions as the Pabartoniai 1 site (see section *'Pabartoniai 1 site'*). It was located on the left side of the small tributary Želmena[182], directly to the east from Pabartoniai 1 site (Maps 25 (D) and 26 (E)). However, a very small assemblage of lithic artefacts did not let to make any further interpretations on the site settling chronology and function, yet it must be noted that the two sites in Pabartoniai village might have been related.

Padaliai 1 site

The site was discovered two decades ago by A. Girininkas during a survey expedition[183]. Several test pits yielded some flint artefacts: parts of cores, an end-scraper and several blades. According to the archaeologist, part of them should be dated to Mesolithic and Neolithic. The site is now under the State protection. The use of blade production technology from double-platform cores could implicate that the site could have been occupied in Final Palaeolithic or Early Mesolithic, yet some artefacts could be also ascribed to some later period.

The site was situated on a sandy prominence on the left bank of the river Neris, on its first terrace above floodplain, around 12–13 m higher than the river water level and approximately 60–70 m away from its flow (Map 30 (I)). A bit further to the west from that place a lake had previously existed, thus it

[182] Jablonskis, K., 1947, 1947 metai (Slownik), Survey diary, Archive of the Lithuanian National Museum, Department of Archaeology, Vilnius. Rimantienė, R., (no date), Pabartoniai, Manuscript article about Pabartoniai site and handmade drawings of the finds, Archive of the Lithuanian National Museum, Department of Archaeology, Vilnius.

[183] Girininkas, A., 1998, Nauji archeologijos paminklai Kaišiadorių rajone / In: Archeologiniai tyrinėjimai Lietuvoje 1996 ir 1997 metais. Vilnius, p. 450. Kurilienė, A., 2009, Kaišiadorių rajono archeologijos sąvadas, Vilnius p. 56–57.

seems that the site was surrounded by bodies of water. The closest tributary was a small river running 950 m away, in the south–southeast.

Pasieniai 1 site

The very first finds known to be discovered in Pasieniai village, on the right bank of the river Neris, were recorded by K. Jablonskis in the late 30s[184]. Only fifty years later a survey expedition was organized and a Stone Age site was found by A. Girininkas[185]. The excavation of this archaeological object has started at once, in 1979. After investigating an area of 20 m^2 it was ascribed to Mesolithic on the basis of lithic typology. In the early 90s, as the site was being destroyed by various anthropogenic activities, it was decided to excavate it and gain as much scientific information as it was possible. The research was taken over by E. Šatavičius and in the upcoming years an area of 320 m^2 was investigated[186]. Only after many years of research the dating of the site was clarified, the lithic assemblage appeared to be of several different periods of Stone Age, whilst the earliest finds horizons were related to the Final Palaeolithic Ahrensburgian and Swiderian cultures[187]. In the last decades some rescue surveys and excavations have been done in the site surrounding area, which was and still is protected by State[188].

Pasieniai site was situated on the right bank of the river Neris, where the first river terrace above the floodplain meets the second, on a slight sandy slope, 5–6 m above the river water level. Around 430–450 m to the east a small tributary was flowing into the big river (Map 36 (O)).

Only several artefacts found in Pasieniai 1 site were available for a closer investigation (Fig. 61:1, 62:1), while the majority of lithics was analyzed on

[184] K. Jablonskis collection in the National Museum of Lithuania, Vilnius.

[185] Girininkas, A., 1980, Naujos akmens amžiaus gyvenvietės Rytų Lietuvoje / In: Archeologiniai tyrimai Lietuvoje 1978-1979 metais, Vilnius, p. 13–16.

[186] Šatavičius, E., 1992, Pasienių I mezolitinės stovyklavietės tyrinėjimai / In: Archeologiniai tyrimai Lietuvoje 1990-1991 metais, Vol. 1, Vilnius, p. 34–37.
Šatavičius, E., 1994, Pasienių 1-osios akmens amžiaus gyvenvietės tyrinėjimai / In: Archeologiniai tyrimai Lietuvoje 1992-1993 metais, Vilnius, p. 34–36.
Šatavičius, E., 1996, Vilniaus rajono akmens amžiaus paminklų tyrinėjimai / In: Archeologiniai tyrimai Lietuvoje 1994-1995 metais, Vilnius, p. 26–29.
Šatavičius, E., 1998, Pasienių 1-osios akmens amžiaus gyvenvietės tyrinėjimai / In: Archeologiniai tyrimai Lietuvoje 1996-1997 metais, Vilnius, p. 41–43.
Šatavičius, E., 2002, Pasienių 1-oji akmens amžiaus gyvenvietė / In: Archeologiniai tyrimai Lietuvoje 2001 metais, Vol. 1, Vilnius, p. 34–36.
Šatavičius, E., 2016, The First Palaeolithic Inhabitants and the Mesolithic in Lithuanian territory / In: A Hundred Years of Archaeological Discoveries in Lithuania, Vilnius, p. 28–30.

[187] Šatavičius, E., 1998, The Early Mesolithic Site of Pasieniai I / In: Pact 54. Bergen, p. 157–169.
Šatavičius, E., 2012, Pasieniai 1 settlement / In: Archaeological Investigations in Independent Lithuania (1990-2010). Vilnius, p. 21–26.

[188] Šatavičius, E., 2007, Žvalgymai ir žvalgomieji tyrimai Pietų ir Rytų Lietuvoje / In: Archeologiniai tyrimai Lietuvoje 2006 metais, Vilnius, p. 473–487.
Brazaitis, Dž., 2008, Žvalgomieji tyrinėjimai Pasienių akmens amžiaus gyvenvietės aplinkoje / In: Archeologiniai tyrinėjimai Lietuvoje 2007 metais, Vilnius, p. 28–31.

the basis of the data described in the excavation reports, published information and the drawings of the tools. Also a large collection of non-flint rock artefacts was accessible and was carefully examined.

Just after the excavation the lithic assemblage was sorted by E. Šatavičius into three separate collections on the basis of tool typology, applied flint knapping technology and the intensiveness of patina color (although it could be argued that the latter criteria is only partly reliable). All these assemblages were dated to Final Palaeolithic, yet were considered as chronologically different[189].

The earliest tool kit was ascribed to Ahrensburgian culture. It yielded two fragmented tanged points formed by retouching the proximal end margins of the blank from dorsal side (Fig. 61:2–3), also one presumed tip of a point (Fig. 61:4), one end-scraper with a working edge formed on the proximal part of the blank (Fig. 62:20), a couple dozen blades and flakes and several burin spalls with margins retouched. As it could be reconstructed from the negatives of the blanks, double-platform cores were used at the site to produce semi-regular as well as non-regular blades. However, no cores found at the site were ascribed to this assemblage, therefore it was assumed that they could have been not present. According to E. Šatavičius, this part of the collection discovered at Pasieniai 1 site could be dated to the first half of the Younger Dryas. Yet the excavated area was not considered as a central campsite of Ahrensburgian group of people, most likely it could have been situated somewhere nearby. The Ahrensburgian assemblage was later supplemented by another one fragment of a point (Fig. 61:1), found during a survey a decade ago[190].

The second distinguished assemblage of the flint finds was related to the Swiderian culture and dated to a period few hundred years later than the first one – to the first half-middle Younger Dryas. This part of the lithic collection found at Pasieniai 1 site was around ten times more numerous. It contained 1 tanged point made of a regular blade produced from an unipolar core (Fig. 61:15). The

[189] Šatavičius, E., 2016, The First Palaeolithic Inhabitants and the Mesolithic in Lithuanian territory / In: A Hundred Years of Archaeological Discoveries in Lithuania, Vilnius, p. 28–30.

[190] Brazaitis, Dž., 2008, Žvalgomieji tyrinėjimai Pasienių akmens amžiaus gyvenvietės aplinkoje / In: Archeologiniai tyrimai Lietuvoje 2007 metais, Vilnius, p. 28–31.

proximal part of the blank was retouched from the ventral side, whilst distal part was formed by a marginal retouch from dorsal side. According to E. Šatavičius, the dorsal part of the blank should be considered a tip[191]. However, the implement could be also interpreted as a leaf-form point with flat retouch on ventral side of the tang (the proximal end), which was later reproduced into some other tool, e. g. a drill. Then, on the basis of its leaf-form, the point would typologically fit the Late Swiderian type (after the typology proposed by E. Šatavičius himself) instead. However, this interpretation could be approved or denied only if a visual or microwear analysis of the tool was available.

Nearly all the end-scrapers made from non-regular blades were ascribed to the Swiderian tool kit (Fig. 62:5–6, 8, 16). One of them was retouched on side margins and could have been combined with a burin (Fig. 62:6). Several burins and some retouched blanks were also added to the assemblage. One burin was made of a non-regular blade and was used in two directions (Fig. 63:1).

Just like in the Ahrensburgian assemblage, no cores were related to this part of the collection. Therefore the flint knapping technology was also reconstructed from the negatives of the artefacts. Most probably the double-platform cores were used for semi-regular blade production. After E. Šatavičius, a soft-hammer percussion technique could have been applied. On the basis of typological and technological criteria, around 60 blades produced in this way were ascribed to the Swiderian flint assemblage. Thus, it seemed that the cores should have existed, but possibly were not found in the excavated area.

A Swiderian toolkit described by E. Šatavičius could have belonged to one person or a small group of people who were temporary camping at the place with a hunting purpose.

The third part of the Final Palaeolithic lithic collection distinguished by E. Šatavičius was the most numerous, it contained nearly five thousand flint finds. Therefore it yielded much more archaeological information about the flint knapping techniques applied for tool production and allowed a more precise interpretation.

[191] Šatavičius, E., 2001, Vėlyvojo paleolito kultūros ir jų likimas ankstyvajame mezolite / Doctoral dissertation, Vilnius University, Vilnius, Fig. 38:1.

According to the archaeologist, visual analysis of more than ten cores and the blanks produced from them had revealed that mostly double-platform as well as unipolar cores were in use. Soft-hammer percussion and pressure flaking was applied for semi-regular and regular blade production. Later they were mostly used for tool making. Also many core preparation and correction flakes were present at the site, thus apparently cores were formed at the site using some nodules brought from somewhere else. According to E. Šatavičius, the flint material was of good-to-high quality.

The presumed tool kit of nearly 300 artefacts contained more than 10 tanged points and their fragments (Fig. 61, 150). They were mostly made of non-regular or semi-regular blades produced from double-platform and unipolar cores. However, several finds stood out as presumably relating to some other assemblage as it could be interpreted on the basis of flint knapping and tool forming technology. E.g. one fragmented tang of a point could be also considered as a tip (Fig. 61:17). Moreover, as it was produced from a very regular blade and the retouch on its ventral side was much more regular and of a marginal type, the artefact could be technologically related to Mesolithic manner of tool making, something similar to Kunda technology. Another implement under discussion was made of a very thin regular blade which was most likely produced from a different type of core than the blanks out of which the rest of the points were made (Fig. 61:16). Therefore it seemed that most of the point assemblage could belong to one complex, but some of them could be excluded. However, numerous hunting tools implicate that a camp at the site was established for hunting activity purposes and was presumably visited by more than one hunter.

Also some semi-regular and non-regular trapezes were discovered at the site. They were mostly made of flakes, while one of them was formed on blade produced from a unipolar core (Fig. 64:11–18). All of them were ascribed to the third assemblage and related to the Late Swiderian culture. According to E. Šatavičius, these finds, as well as some microliths found at Pasieniai 1 site, have shown the attempts of human adaptation to the changing climate and

assortment of hunted prey, and this interpretation could seem quite convincing.

Nearly 30 scrapers were ascribed to the Late Swiderian assemblage (Fig. 62). They were formed from semi-regular and non-regular blades as well as from flakes, and usually had one working edge formed on the distal or proximal end of the blank. The width of the scraping edge was mostly around 1,5–2,00 cm, while three tools were formed with a bit wider working edge. However, no extremely narrow or wide scrapers were present (in comparison with other lithic assemblages found along the river), thus it might implicate that no very precise working on tiny things has been done, as well as no very rough scraping was applied on any material.

The supposed Late Swiderian cutting tool kit consisted of a few dozen retouched blades, most probably used as knives and burins (Fig. 64:1–10). The latter implements were used in one and in two directions. Cutting edges were formed on various flakes and non-regular blades and their fragments. They were usually corrected at least several times. Basically burins were made in a quick manner, without a thorough selection of a blank, once some cutting work was about to be done.

The assemblage also contained several borer-like tools, an axe and numerous implements of non-determined function. Such a wide variety of flint tool types implicated that the site could have been settled for a bit longer time as a lot of different activities took place in the area. Also an interpretation that the Swiderian group of people was quite numerous would be possible.

According to E. Šatavičius, the Late Swiderian flint assemblage which he has distinguished should be also related to several archaeological features unearthed in the central part of the site during the excavation. These presumptions were made on the basis of the correlation between the distribution of finds and archaeological features, as well as of the stratigraphy. Two of the features were interpreted as refuse pits. The first one was of more than 2 m wide and more than 1 metre deep, whilst the second was proportionally twice as small. Both features stood out from the surrounding sediment by their color and yielded many flint artefacts. Non-flint rock finds were also present within the

limits of these features and in their close vicinity. Whilst also a flint knapping activity zone found a few metres away from one of these features was also ascribed to the same archaeological horizon. However, the typological-relative dating of all these features should be considered reservedly until further investigation has been done.

The collection of non-flint rocks artefacts was available for a visual investigation and was already examined by the author of this study[192]. In total 645 artefacts were identified, and up until today it is the biggest collection of non-flint rock finds dating to Final Palaeolithic–Mesolithic period discovered in Lithuania. It contained 7 cores of quartzite, sandstone and porphyry, nearly 600 flakes of various rocks, as well as 78 blades. Therefore it was presumed that for some reason various types of rocks, other than flint were used at the site quite intensively, however, almost no implements were discovered. One basalt axe formed by flaking dorsal and ventral sides of a pebble was found. It was presumably dated to Early Mesolithic. Another artefact was ascribed to some sort of scraping implements, though its function could be considerable. It was made of a quartzite flake; one edge was roughly retouched to form a denticulated working margin, which seemed to be utilized. The implement had also had a tip which could have been used as a burin. The quartzite material should have been available somewhere in the nearest surroundings, as many natural quartzite pebbles were found in the site area. On the contrary, sandstone boulders could have been brought to the site from somewhere else as the site yielded only cores and blanks. However, quite a high number of sandstone surface flakes implicated that the cores were formed in situ.

The quartzite and sandstone cores found in Pasieniai 1 site were of two types – double-platform and multidirectional (Fig. 151–154). As it was determined after a visual analysis done on the cores and flakes, the edges of the core platforms were not worked before striking. Mostly flakes were produced, yet several blades were also (accidentally?) made. As it could be reconstructed

[192] Rimkutė, G., 2012, Netitnaginių uolienų apdirbimo technologijos ir dirbinių gamyba finaliniame paleolite–mezolite Lietuvoje / In: Archaeologia Lituana, Vol. 13, Vilnius, p. 34.

from the flaking direction, one sandstone core was most likely knapped by a right-handed person. The core was rather big and weighed around 1200 grams, thus assumedly it was worked by a strong person, most probably a man. It was also possible that the core was worked after putting it on the ground or someone's knees. As pressure technique could not be applied, mostly direct hard or semi-hard striking was used.

Another sandstone core was actually a big flake of raw material which was later worked further. It would be important to note that the core, as well as other cores found at the site, was quite far from being completely used. Formation of double-platform cores was typical for Final Palaeolithic flint knapping technologies, therefore it was also presumed, that double-platform cores of other raw material could be dated to the same period.

Another interesting archaeological feature related to the same horizon was a particular wall-form distribution of some stone pebbles (Fig. 149) and a large boulder. These stones were brought to the site intentionally, they could have been used as parts of some prehistoric construction.

There were also several stains of greyish color unearthed at the site. The filling was mixed with charcoal, therefore it was presumed that they could have been remains of some hearths. However, as no change in sediment color or hardness was recorded, it might be assumed that either the fire temperature reached was not very high, or they were used for very short periods of time. Also, the features could have been of some different function than hearths (as well as of bioturbational nature).

E. Šatavičius has also mentioned several finds of organic material: a fossilised piece of wood (presumably of *Pinus sylvestris*) and a concretion of dark grey color resin (Fig. 150:4). As these finds were not dated by AMS ^{14}C dating or described in details, it was difficult to determine if they could be related to the first site settling stages.

To sum up, although sorting of the collection into three separate assemblages could have been considered as partly reasonable, the distinction of the two Swiderian tool kits could be and should be revised and discussed as

some finds could have been misinterpreted or could have been asserted to a different assemblage. In general two stages of site settling by Swiderian groups of people seemed a possible interpretation of the archaeological data from Pasieniai 1 site. However, if all tools were taken into account and sorted into several chronologically different assemblages without taking in consideration the criteria of patina color intensity (as it was done in this study, as only the drawings of the finds were examined), the distinguished collections would be quite different. On the basis of a fundamental separation between Early and Late Swiderian types of tools as suggested by E. Šatavičius himself[193], most probably one Early Swiderian assemblage could be distinguished which would encompass most of the artefacts found at Pasieniai 1 site. It could possibly (yet less likely) comprise two point tang fragments, that were previously ascribed to Ahrensburgian complex (Fig. 61:1–2), as some archaeologists have also admitted that Swiderian and Ahrensburgian types of points could sometimes be common for a horizon of one settlement[194].

While on the other hand, part of the tools ascribed to the Early and Late Swiderian assemblages were made of very regular blades produced from unipolar cores. It would be questionable, why then some retouched (probably as well as many unretouched) regular blades were not used for point making instead? The points were formed from non-regular blades produced from double-platform cores, the same character could be applied to scraper or burin making. It seems though, that some Mesolithic finds made from regular blades were ascribed to the Early and Late Swiderian tool kits and therefore the interpretation could have become a bit misleading. Whilst E. Šatavičius has admitted that some artefacts common to Mesolithic Kunda culture were present at the site, however, he had added them to the Late Swiderian assemblage and interpreted them as very first signs of the technological transition to Mesolithic manner of tool making[195]. The latter hypotheses could be approved, yet most

[193] Šatavičius, E., 2001, Vėlyvojo paleolito kultūros ir jų likimas ankstyvajame mezolite / Doctoral dissertation, Vilnius University, Vilnius, p. 111–113.

[194] The same, p. 112.

[195] Šatavičius, E., 2016, The First Palaeolithic Inhabitants and the Mesolithic in Lithuanian territory / In: A Hundred Years of Archaeological Discoveries in Lithuania, Vilnius, p. 30.

probably one later Late Swiderian stage of site settling in Mesolithic (Late Preboreal?), which would include the tools made from regular blades produced from unipolar cores, should have been distinguished instead.

The criteria of flint patina intensity could reveal some different kind of flint used, a probable relation between artefacts produced from the same core, or some different postdepositional chemical environment where the finds were laying, yet not the finds chronology itself. Unfortunately, no ^{14}C dates are known from Pasieniai 1 site, but some organic material (e.g. charcoal) has been discovered and might still be examined. Then the relation between the finds horizon and features unearthed would be clarified as well.

Pugainiai site

Pugainiai (a.k.a. Pugainiai-Papiškės) site was discovered by K. Jablonskis in the mid 20th century. It was located on the left bank of the river Neris, close to the lower reaches of a small tributary Bražuolė. Back then the exact place of the site was not recorded. However, Pugainiai village was revisited in the late 90s by E. Šatavičius. A Final Palaeolithic settlement was found on the third river Neris terrace above floodplain, around 300 m away from the intersection of the two rivers[196], approximately 12–14 m above the river water level (Map 34 (M)). By that time the lithic assemblage was ascribed to Swiderian culture. Up until today it is not clear if it was the same site discovered by K. Jablonskis, or if two separate archaeological objects existed in the same area.

The site could be typologically ascribed to Final Palaeolithic on the basis of only several finds from K. Jablonskis collection: a burin and a scraper fragment made from a rather good quality flint material. Even though the artefacts collected later were not available for analizing, they could have been impressive as on the basis of the lithic assemblage the site was titled as one of the most important Swiderian sites found in Lithuania[197]. However, also an opinion that it could be an Ahrensburgian site was expressed in the last decades

[196] Šatavičius, E., 2000, Nauji akmens amžiaus paminklai Rytų ir Pietų Lietuvoje/ In: Archeologiniai tyrinėjimai Lietuvoje 1998-1999 metais, Vilnius, p. 80.

[197] Šatavičius, E., 2016, The First Palaeolithic Inhabitants and the Mesolithic in Lithuanian territory / In: A Hundred Years of Archaeological Discoveries in Lithuania, Vilnius, p. 20, Fig. 14.

by the founder of the site himself[198]. It seems that it became a question of discussion, though the latter interpretation was supported by A. Girininkas[199] (Map 14).

Radikiai site

Radikiai site was an archaeological object of six separate places yielding flint artefacts of different dating (up to the Bronze Age). The site was already located in the beginning of the 20th century by archaeologist T. Dowgird[200]. Later it was visited by other archaeologists and now the finds are kept in two museums in Vilnius and Kaunas.

The site was in between two small tributaries, on the right bank of the river Neris, on the first and second river terraces above floodplain[201]. At the time of the discovery it was a plain area of high sand dunes around 500 m northeast from the river flow (Map 23 (B), Fig. 155).

All the places where archaeological finds concentrated were named by K. Jablonskis and R. Rimantienė as Radikiai A, B, C, Č, D and E. Later this numeration was changed into Radikiai 1, 2 and 3. The site covered an area of around 0,1 km^2 and the find concentrations were relatively close to each other. The earliest artefacts typologically dating to Final Palaeolithic were discovered in few of the closely situated concentrations of finds, which were 400 m northeast from the river Neris in between two tributaries, on the second river terrace. While the site also yielded Middle–Late Mesolithic and Neolithic–Bronze Age flint artefacts. Back in the early 60s the collection was basically described as Neolithic, though it was noticed that some of the finds might be dated to earlier periods, Mesolithic at earliest[202]. Some parts of the site were investigated in the late 50s by the archaeologists from Kaunas Museum of History, but no archaeological features that could correlate with the earliest

[198] Šatavičius, E., 2005, Žvalgymai ir žvalgomieji tyrimai Rytų ir Pietų Lietuvoje / In: Archeologiniai tyrinėjimai Lietuvoje 2004 metais, Vilnius, p. 296.

[199] Girininkas, A., 2009, Lietuvos archeologija. Akmens amžius, Vol. 1, Vilnius, p. 55, Fig. 42:13.

[200] Dowgird, T., 1909, Dziennik badań archeologicznych od stycznia 1881 roku do 1 stycznia 1888 roku Tadeusza Dowgirda, Manuscript, Department of Vilnius University, Archive 1, p. 75.

[201] Rimantienė, R., 1974, Akmens amžiaus paminklai / In: Lietuvos TSR archeologijos atlasas. Akmens ir žalvario amžiaus paminklai, Vol. I, LTSR Mokslų akademijos istorijos institutas, Vilnius, p. 67, depiction No. 276.

[202] Jablonskytė-Rimantienė, R., 1965, Radikių akmens amžiaus stovyklos / In: Lietuvos TSR Mokslų akademijos darbai, A, Vol. 1 (18), Vilnius, p. 35.

settling were unearthed[203]. Back in the early 70s R. Rimantienė has described Radikiai 1 site as 'Epi-Palaeolithic'[204]. However, later she interpreted the biggest part of the flint finds collection as Neolithic and thought that the artefacts inherent for earlier periods show the continuity in flint tool producing techniques[205]. This interpretation followed as a result of a belief that Radikiai site should have been occupied only once and that the find horizon was homogeneous. However, the typological variety of flint tools in the collection clearly shows that the site was settled at least three times: in Final Palaeolithic, in Mesolithic and later in Neolithic–Bronze Age. In the sandy ground finds have mixed due to the post-depositional processes.

The flint finds collection was studied carefully for few times later by E. Šatavičius and T. Ostrauskas. In the end of the 20th century a Final Palaeolithic settling phase in Radikiai site was approved after identifying Ahrensburgian and Swiderian types of points in lithic assemblage[206] (Fig. 67:1–4).

For this research the find complex which could be ascribed to the earliest inhabitants was analyzed, though finds typologically characteristic to Mesolithic and artefacts of non-determined dating were also taken into account as possibly related to the first settling of the place. The flint finds collection was rather big, however, the earliest finds were the smaller part of it. Most of the artefacts were made of a high quality flint material, using an unipolar soft flint knapping/pressure technique for very tiny regular blade production. The tools made of these blades and microliths were typical for Mesolithic and only some of them could be ascribed to the Final Palaeolithic assemblage. The existance of a Mesolithic settlement in Radikiai was approved by a Late Swiderian/Kunda type point found in the site[207] (Fig. 67:5). There were also two microliths with barbs[208], similar to the Reseta type artefacts, which are related to the Swiderian

[203] Jablonskytė-Rimantienė, R., 1965, Radikių akmens amžiaus stovyklos / In: Lietuvos TSR Mokslų akademijos darbai, A, Vol. 1 (18), Vilnius, p. 35.

[204] Римантене, 1971, Палеолит и мезолит Литвы, p. 99, Fig. 85:14.

[205] Rimantienė, R., 1984, Akmens amžius Lietuvoje, Vilnius, p. 202–203, Fig. 107.

[206] Šatavičius, E., 2001, Vėlyvojo paleolito kultūros ir jų likimas ankstyvajame mezolite / Doctoral dissertation, Vilnius University, Vilnius, p. 89, 111.

[207] Jablonskytė-Rimantienė, R., 1965, Radikių akmens amžiaus stovyklos / In: Lietuvos TSR Mokslų akademijos darbai, A, Vol. 1 (18), Vilnius, p. 35, Fig. 4:1. Šatavičius, E., 2001, Vėlyvojo paleolito kultūros ir jų likimas ankstyvajame mezolite / Doctoral dissertation, Vilnius University, Vilnius, p. 111.

[208] Jablonskytė-Rimantienė, R., 1965, Radikių akmens amžiaus stovyklos / In: Lietuvos TSR Mokslų akademijos darbai, A, Vol. 1 (18), Vilnius, p. 37, Fig. 5:31–32.

culture impact and might be dated to Early Mesolihic[209]. Some similar, though not the same equivalents were found in Lithuania[210] and Western Belarus[211]. However, Radikiai microliths are of considerable dating and could be related either to Mesolithic or Neolithic.

The collection of flint finds also contained non regular or semi-regular blades produced by knapping double-platform as well as unipolar cores. A big part of them were utilized or retouched, used for cutting.

Not many burins were discovered in the site (Fig. 70). Typologically they could be related to the Final Palaeolithic or Early Mesolithic assemblage. Whereas scrapers were more numerous. The ones made of very regular blades produced from an unipolar core presumably fit the Mesolithic assemblage, whilst the big and flat ones, also the scrapers made of non regular blades or blades produced from a double-platform core were related to the Final Palaeolithic collection of artefacts. Some scrapers were with a scraping edge formed on a proximal end of the blank. This feature was also considered as common for Final Palaeolithic–Early Mesolithic.

The variety of flint tools in Radikiai site was quite big, meaning that some groups of people probably stayed there for longer and had more activities than hunting/fishing and the prey treatment. It was probably in Mesolithic when people needed some toolkit for cutting, drilling, pronging, peeling, etc (Fig. 68–69), however, some of these tools could belong to their predecessors as well. After the flint finds analysis function of some of them was reconsidered. An implement of non determined dating previously interpreted as a knife[212] turned out to rather be a some sort of a dagger-type tool as no traces of utilisation were found on the sides of this find, but its top was heavily used for pronging instead. Moreover, its lower part might have been handled. Another artefact with a clarified function was an awl or a thin drill (Fig. 68:17)

[209] Sorokin, A. N., 1995, On the Problem of Influence of Volga-Oka Mesolithic to the Origine of Kunda Culture / L'Europe des derniers chasseurs, 5e Colloque international UISPP, 18-23 sept., p. 427, Fig. 1.

[210] Ostrauskas, T., 1998, Lietuvos mezolito gyvenviečių periodizacija / Doctoral dissertation, Vilnius University, Vilnius, Fig. 24:13. Ostrauskas, T., 2002, Mezolitinė Kudlajevkos kultūra Lietuvoje / In: Lietuvos archeologija, Vol. 23, Vilnius, p. 143, Fig. 5:19.

[211] Obuchowski, W., 2009, Materiały paleolityczne i mezolityczne z zachodniej Białorusi / In: Światowit – Suppement Series P: Prehistory and Middle Ages, Vol. XVI, Warszawa, p. 162, Fig. XCVI:21-22; p. 242, Fig. CLXXVI:8.

[212] Jablonskytė-Rimantienė, R., 1965, Radikių akmens amžiaus stovyklos / In: Lietuvos TSR Mokslų akademijos darbai, A, Vol. 1 (18), Vilnius, p. 36.

which was previously thought to be a retouched blade, because the implement was broken into two pieces[213].

A part of the flint finds were affected by a high temperature, therefore it might be presumed that some fireplaces existed in the site area. It is worth to mention that some burnt bone fragments were also present at the site, however, their relevance to some particular stage of site settling is unconsiderable without AMS ^{14}C dating done.

At least four scrapers and a burin were made from flint decortication flakes (Fig. 66:2, 5, 6, 9). These implements might show an economic use of the flint that Final Palaeolithic people had. A presumption would follow that these people had some limited amount of flint cores for tool producing and made their implements directly at the site. The function of these above mentioned tools – scraping and cutting – would lead to an interpretation that some sudden need for hunt prey treatment tools appeared and people made and used the tools very quickly, without a preparation in advance. Therefore it might be presumed that in Final Palaeolithic Radikiai site was visited only for a very short-term stay and then suddenly abbandoned. However, these presumptions could only be approved if the lithic assemblage refitting was applied, but as it was picked from the surface and was not fully collected, this method might be impossible to use.

It seems that people in Radikiai site had a high quality flint material available throughout all the stages of inhabitance. As the tanged points of various types (mostly Ahrensburgian) were found in different places in Radikiai site area, it might be presumed that it was visited for at least few times in Final Palaeolithic. The main purposes of the visits were hunting and the hunt prey treatment. Palaeolithic people should have seen that the place was once visited before them, though they did not choose to camp at exactly the same place. It could be assumed that the two types of arrows – Ahrensburgian and Swiderian – might possibly reflect one of these actions:

a) a show up of two different archaeological cultures (whereas not determined which ones were the first),

[213] Jablonskytė-Rimantienė, R., 1965, Radikių akmens amžiaus stovyklos / In: Lietuvos TSR Mokslų akademijos darbai, A, Vol. 1 (18), Vilnius, Fig. 5:36.

b) these two groups could have met at Radikiai site,

c) or the different arrows belonged to the same one group of people and were used for hunting a different types of game.

Later the site was important for Mesolithic and Neolithic–Bronze Age people, who had stayed in Radikiai for longer periods of time than their predecessors, and their groups were more numerous. Therefore the archaeological finds left by later settlers had formed a major part of all the data discovered in Radikiai site throughout the 20th century.

Rusiai site

The site was already known to archaeologists in the beginning of the 20th century. It was visited for at least a few times by K. Jablonskis and J. Puzinas, who had followed the primary information about the site given by P. Tarasenka in the mid-20s[214]. The lithic assemblage discovered in Rusiai was kept in two separate museums in Vilnius and Kaunas. During the analysis of these two collections, an interesting fact was noticed: according to the labels, K. Jablonskis and J. Puzinas had picked artefacts on the same day – October 22, 1938. This case showed that back then private intentions were more important than the formation of a permanent archaeological collection of Rusiai Stone Age site – the artefacts found by two archaeologists were not combined into one assemblage.

The lithic collection from Rusiai site was never published, however, some attention was paid to it in the end of the 20th century. From the very beginning it was misinterpreted as a Stone Age settlement with remains of human graves[215], which appeared to be of Iron Age (Fig. 173), a bit later – as a Neolithic site[216]. One flint point, though never published, was mentioned as an example of a very fine work of a prehistoric man. According to P. Tarasenka,

[214] Tarasenka, P., 1922, Ieškojimai neries ir Šventosios santeklyje / In: Mūsų senovė, Vol. 1, book No. 4–5, Kaunas, p. 587.
Tarasenka, P., 1924, Panerio pirmykštės kultūros sėdybos (Nuo Kernavės iki Kauno) / In: Kultūra, Mėnesinis iliustruotas mokslo populiarus žurnalas su „Daigų“ priedu, No. 7–8, Kaunas, p. 308–309.
Tarasenka, P., 1925, Gimtoji senovė. Ieškojimas, pažinimas, apsaugojimas, Kaunas, p. 18, 23.
Tarasenka, P., 1928, Lietuvos archeologijos medžiaga. Materialien für litauische Archeologie, Kaunas.

[215] Tarasenka, P., 1925, Gimtoji senovė. Ieškojimas, pažinimas, apsaugojimas, Kaunas, p. 18, 23.

[216] Rimantienė, R., 1984, Akmens amžius Lietuvoje, Vilnius.
Rimantienė, R., 1974, Akmens amžiaus paminklai / In: Lietuvos TSR archeologijos atlasas. Akmens ir žalvario amžiaus paminklai, Vol. I, LTSR Mokslų akademijos istorijos institutas, Vilnius, p. 70, depiction No. 294.

more than 100 retouch negatives showed that a tool was produced with thoroughness and took a long time[217].

The exact location of this archaeological object was depicted in 1925 by P. Tarasenka (Fig. 173). According to the find labels in the museum and a short description in the atlas or archaeological sites[218], it was a sandy area on the left bank of the river Neris in Rusiai village (Map 29 (H)). After relating the scheme drawn by P. Tarasenka with a modern map a probable location of Rusiai site was determined. Most likely it was the sandy area overgrown with a forest on a first terrace above the floodplain, where local inhabitants have been recently mining sand and gravel. At that point a small ravine on the second terrace can be seen, and a nameless tributary runs into Neris (also seen in P. Tarasenka scheme). However, the first terrace was transformed into agricultural area and man-grown forest, also the water flow of the nameless tributary was partly changed, but it seems that it could have been running very close to the sandy area. Today the area is protected by State as a Zūbiškės Iron Age cemetery.

As it was seen from the scheme (Fig. 173), flint artefacts were found in the northern part of the surveyed area (marked as '▲'), closer to the river Neris (around 100–200 m south from the river flow, and 200–500 m east from the small tributary). Also several archaeological features – grey spots of sand mixed with ashes – were identified, though their coherence with the Stone Age archaeological horizon was considerable.

Even though the lithic assemblage was previously ascribed to Neolithic period[219] (probably due to re-writing the old information without re-evaluating the collection), the lithic assemblage, though not very big, could typologically be related to two stages of site settling – Final Palaeolithic and Neolithic. The finds of the earlier phase are: a double-platform and few unipolar flint cores, some burin flakes, non regular blades. The implements which could be ascribed to Final Palaeolithic were not numerous: one fragment of a Late

[217] Tarasenka, P., 1927, Priešistorinė Lietuva, Kaunas, p. 49–50.

[218] Rimantienė, R., 1974, Akmens amžiaus paminklai / In: Lietuvos TSR archeologijos atlasas. Akmens ir žalvario amžiaus paminklai, Vol. I, LTSR Mokslų akademijos istorijos institutas, Vilnius, p. 70, depiction No. 294.

[219] Kurilienė, A., 2009, Kaišiadorių rajono archeologijos sąvadas, Vilnius p. 63–64.

Swiderian point, three fragments of artefacts which could have been parts of points (Fig. 71), some scrapers made of wide non regular blades (Fig. 72), few burins, implements of non-determined function and retouched or utilised blanks (Fig. 73).

A correlation with Radikiai site was noticed when analysing the flint artefacts of Rusiai site: there were also few scrapers and burins made of blanks with cortex. Therefore an identical interpretation might be applied that these tools show a very quick stop at the site for a particular work – hunting ant prey treatment – to be done. The tools were made of good quality flint. They were most likely produced by knapping only one or two cores which were brought into the site. Only few scrapers had retouched or utilized sides – traces probably left due to putting them into handles (Fig. 72:5–7, 9). These implements might have been produced beforehand and used for longer.

The study of Final Palaeolithic tool assemblage of Rusiai site might lead to the presumption that it could have been visited at least for one time, maybe two. Some of the implements used at the site could have been quickly produced in situ, while other tools might have been made in advance and brought into the site. As it could be seen from the types of lithic tools, the site was occupied for hunting and hunted prey treatment purposes.

Saidžiai site

Saidžiai site was recorded in the early 40s, after K. Jablonskis had got some information about it from archaeologist Włodzimierz Hołubowicz (it was previously named as Šilėnai site) and discovered some flint artefacts there on the right bank of the river Neris. Back then it was a small area on the second river terrace yielding flint finds and fragments of pottery[220]. After visiting the village in 2018 an approximate site location was determined and several flint artefacts were discovered (Map 35 (N)).

The lithic assemblage is small, yet the biggest part of it should be related

[220] Rimantienė, R., 1974, Akmens amžiaus paminklai / In: Lietuvos TSR archeologijos atlasas. Akmens ir žalvario amžiaus paminklai, Vol. I, LTSR Mokslų akademijos istorijos institutas, Vilnius, p. 70, depiction No. 295.
Jablonskis, K., 1942, Survey diary, Archive of the Lithuanian National Museum, Department of Archaeology, Vilnius.

to Neolithic or Bronze Age period. However, one artefact did indicate that the site was settled at least for two times and the first stage of settling was in Final Palaeolithic or Early Mesolithic: it was a double-edged scraper made of a wide semi-regular blade (Fig. 74:5). The implement was made and used in Final Palaeolithic or Early Mesolithic and later, presumably in Neolithic, it was repeatedly retouched on both sides. Also some other flint tools made from wide blades produced from a double-platform core could be ascribed to the earlier stage of site settling (Fig. 74). However, as their function is hard to determine (only one implement could be interpreted as a knife), no further insights on what kind of activity took place in Saidžiai site as it could have been butchering as well as leather working or something else.

The lithic assemblage also contained a probable remain of a double-platform core and some blanks produced from unipolar as well as from a double-platform core. The flint material was of a good quality, therefore it might be presumed that some nodules were brought to the site and then tools were prepared. It would be difficult to determine which archaeological culture the earliest finds of Saidžiai site could belong to, as there were no typical points found, yet there were opinions, that it could be regarded as Swiderian[221] (Map 15).

Saleninkai 1 site

The site was discovered by K. Jablonskis, who was visiting Saleninkai village in 1938–1939 after learning about some Stone Age archaeological material found in the village by P. Tarasenka (see section *'Saleninkai 2 site'*). He and his daughter R. Jablonskytė had collected flint artefacts from several sandy areas around the village and one of them, situated on the right river Neris bank, on the first terrace above the floodplain (4–7 m higher than the water level) very close to the river flow, was named as the site '1' (Maps 27 (F) and 28 (G)). Back then it was interpreted as Mesolithic site yielding

[221] Girininkas, A., 2009, Lietuvos archeologija: Akmens amžius, Vilnius, Vol. 1, p. 59, Fig. 48A.

Magdalenian and Swiderian type of implements[222].

The lithic assemblage contained finds from various archaeological periods. However, the earliest part of it could be discerned and analyzed. It would include several unipolar cores, blades of various size produced from double-platform and unipolar cores and implements made from those blanks (Fig. 75:1–9). A proximal part of a tanged point of Swiderian type allowed to relate the assemblage to the Final Palaeolithic or Early Mesolithic (Fig. 75:1), whilst there was also a small assemblage of tools made from a same flint nodule (Fig. 75:10–13), which should be ascribed to Late Swiderian/Kunda culture. The two scrapers made from one long blade are typologically alike and were made by one person. Therefore, it could be also assumed that a point (Fig. 75:13) was also a product of the same man.

Another important feature is the ratio between lithic implements produced and the flint debitage: although there were many wide and long blanks produced from good quality cores, mostly blades of approximately 1,5–2,0 cm width were used for making scrapers. Some blanks would have perfectly fit to form a scraper, though they were left unused. What was more, some of the crested blades of the presumably demanded width were used instead (Fig. 75:5–6). Therefore it might be assumed, that prehistoric people at the site needed small to middle size scrapers for some particular task to be done. It would follow that some rather small pieces of hide were worked at the site. The lack of burins in the lithic assemblage would also indicate that almost no cutting/meat dividing activity was done. To conclude, despite of other animals, most likely also some small game was hunted and treated at Saleninkai 1 site during the Final Palaeolithic–Early Mesolithic stay. Moreover, the cores of good quality flint were not utilized completely. Thus, the prehistoric inhabitants had no lack of flint material and could have chosen the blanks which would fit their demands for tool making.

The earliest lithic assemblage of Saleninkai 1 site should be dated

[222] Rimantienė, R., 1974, Akmens amžiaus paminklai / In: Lietuvos TSR archeologijos atlasas. Akmens ir žalvario amžiaus paminklai, Vol. I, LTSR Mokslų akademijos istorijos institutas, Vilnius, p. 70–71, depiction No. 298.

reservedly as the site might have been visited for several times in Early Mesolithic. The variety of flint implements shows that the main purposes of the visits were hunting and the hunt prey treatment.

Saleninkai 2 site

Saleninkai 2 site might be the same place which was mentioned to have been discovered by P. Tarasenka in 1922, when the explorer had published some information about a sandy place yielding loads of flint artefacts to the east from Saleninkai village[223]. It was a wide sandy area (presumably up to 100 000 m^2) around 100–300 m away from the river Neris flow, on the second terrace (Maps 27 (F) and 28 (G)). The village was visited for several times in the late 70s, however, as the exact place of the site was incorrectly located, no archaeological finds were discovered[224].

Some lithic finds collected by P. Tarasenka are still kept in the museum in Kaunas, whilst the biggest assemblage was collected by K. Jablonskis, who had visited the village many times in the following decades. According to the notes made by R. Rimantienė, who has visited the site together with K. Jablonskis, the artefacts assembled into separate zones, which could be typologically ascribed to an earlier (Mesolithic) or later (Neolithic) period.

Back in early 20s some other finds discovered at the site were attributed to the Stone Age settlement: some pottery fragments, remains of a fireplace and even a few teeth belonging to (supposedly) *Bos primigenius*[225]. However, it could be assumed that those were some remains of a cow and some archaeological material of a much later stage of settling, which should not be analyzed together with the lithic assemblage, at least with the earliest flint finds typologically dating to Final Palaeolithic or Early Mesolithic.

The lithic assemblage contained a great variety of implements. After studying the archaeological data in the museums, it was seen that some of the

[223] Tarasenka, P., 1922, Ieškojimai neries ir Šventosios santeklyje / In: Mūsų senovė, Vol. 1, book No. 4–5, Kaunas, p. 586.

[224] Respublikinis žemėtvarkos projektavimo institutas, 1976, Lietuvos TSR Jonavos rajono kultūros ir gamtos paminklų katalogas, Archive of the Centre of Cultural Heritage, Vilnius.

[225] Tarasenka, P., 1924, Panerio pirmykštės kultūros sėdybos (Nuo Kernavės iki Kauno) / In: Kultūra, Mėnesinis iliustruotas mokslo populiarus žurnalas su „Daigų“ priedu, No. 7–8, Kaunas, p. 309.

tools were typical to Swiderian culture (Fig. 76). However, the points differed a lot in terms of their producing technology and the manner of retouching. Some of them stand out in color or different intensity of patina covering. It might be presumed that the arrows were made by at least few different people, and most probably – not at the same time. Moreover, the sandy area in Saleninkai was most likely visited for few times in Final Palaeolithic and in Early Mesolithic. Some fragments were hard to identify or ascribe to a tool kit of an archaeological culture, however, basically all the points were of Swiderian type. Only one scraper was similar to Wehlen type (Fig. 78:18), therefore also its relation with some Final Palaeolithic archaeological culture could be taken into consideration.

Other lithic implements were made from different blanks, whilst, e.g. scrapers could be sorted into four different groups: made from 1) decortication flakes, 2) semi-regular blades, 3) crested blades and 4) flakes (Fig. 78). The use of crested blades, as it was mentioned above, was quite usual for the people who had camped at Saleninkai site. A few drills were made from similar blanks (Fig. 77:2, 3). The size of scrapers differed much more than at Saleninkai 1 site, therefore it could be assumed that most probably prey animals hunted and treated in the area were of various sizes.

The high amount of implements made from decortication flakes show that raw material pebbles were brought to the site, cores were prepared and knapped during the stay. Blades produced from double-platform and unipolar cores were also numerous. Therefore not only Final Palaeolithic and Mesolithic people could have used the flint blanks, but they could have been handy for later visitors. Comparing with Saleninkai 1 and 3 sites, here the cores were used completely (Fig. 79), and it would be questionable if the earliest inhabitants used them or if there were Neolithic–Bronze Age people who did.

A relatively small part of lithic assemblage was affected by fire, thus maybe there was no fire making object in the sandy area where the archaeological survey was carried out. The variety of tools used at the site, even if they belonged to several different groups of people, show that various

handcraft activities took place at Saleninkai 2. Therefore assumedly the group of one camping stage settlers could have been quite big, or the people have stayed there for a longer time as the activities were time consuming.

Saleninkai 2a site

A small eastern area of the big sands in Saleninkai village was originally named as Saleninkai 2a site by its founders K. Jablonskis and R. Jablonskytė. In the late 30s they had noticed that a particular place of around 10 m^2 yielded a small amount of lithic artefacts (Maps 27 (F) and 28 (G)) which were interpreted as dating to Mesolithic[226]. The collection was recently kept in the National Museum of Lithuania. It contained four Late Swiderian/Kunda type points, one Ahrensburgian point, few implements (Fig. 83), several wide and long semi-regular blades and some fine flint debitage. The Ahrensburgian point could be interpreted as the earliest find at the site (Fig. 83:1) and be related to Final Palaeolithic campers. Whilst on the basis of flint knapping technology character the biggest part of lithic assemblage could be dated to Early Mesolithic. In the Early Mesolithic the site was probably occupied by the same people who had settled in the sands of Saleninkai as the finds were more or less alike.

Saleninkai 3 site

Just as Saleninkai 1 site, the so called 'third' site was discovered by K. Jablonskis and his daughter during the repeatedly organized surveys in Saleninkai village in the late 30s. Presumably it was a sandy area somewhere a bit further upstream, on the second river Neris terrace, around 400-450 m away from its flow, approximately 11 m above water level. At that point the river turns to the north and there is an island (Map 28 (G)).

The collected lithic assemblage was mainly flint knapping debitage and a small amount of tools and their fragments. Unlike at the other Stone Age sites in Saleninkai village, the flakes of poor quality flint at Saleninkai 3 site were

[226] Rimantienė, R., 1974, Akmens amžiaus paminklai / In: Lietuvos TSR archeologijos atlasas. Akmens ir žalvario amžiaus paminklai, Vol. I, LTSR Mokslų akademijos istorijos institutas, Vilnius, p. 70–71, depiction No. 298.

numerous. It shows that this place was a flint knapping zone, which was most probably occupied for several times in Stone Age. This presumption could be approved by the fact that some blanks with a later retouch marks without patina were also discovered.

Flint artefacts were similar to the other lithic assemblages of Saleninkai sites and could be first of all related to some hunting or at least arrow producing activity (Fig. 82). Typologically the arrows could be related to Swiderian technology and should be dated to Final Palaeolithic–Early Mesolithic. Though, it should be mentioned that the arrows could be of not an exactly the same chronology: one of them could be an Early Swiderian tanged point (Fig. 82:1).

***

To conclude, Saleninkai village was first visited in Final Palaeolithic for a short stay related to hunting activity. Later it was repeatedly visited for several times in Early Mesolithic and Neolithic–Bronze Age. The place attracted prehistoric people particularly where the sandy areas where situated. Those areas could have been occupied in Early Mesolithic by the same group of people, though in a rather scattered way. Although there was no small tributary of river Neris nearby, the site was located close to a very significant place – an intersection of river Neris and its big tributary Šventoji. The place was worth visiting and staying at for longer particularly for hunting purpose as people had come there bringing nodules of very good quality flint, prepared hunting tools, treated their hunt prey and most probably did that for a few times repeatedly.

Saliai site

Saliai prehistoric site (a. k. a. Kleboniškiai site) was discovered by P. Tarasenka in the early 20s[227]. However, later it was not surveyed further and was not included neither in the overwhelming atlases of archaeological sites, nor in archaeological literature. According to the map drawn in 1928, the site

[227] Tarasenka, P., 1924, Panerio pirmykštės kultūros sėdybos (Nuo Kernavės iki Kauno) / In: Kultūra, Mėnesinis iliustruotas mokslo populiarus žurnalas su „Daigų“ priedu, No. 7–8, Kaunas, p. 309.
Tarasenka, P., 1928, Lietuvos archeologijos medžiaga. Materialien für litauische Archeologie, Kaunas, p. 157.

was located on the right bank of the river Neris. Presumably it was situated on the first terrace, somewhere not very far from a small tributary Saliai, approximately 6–7 m above the river Neris water level (Map 23 (B)). An important natural feature of the landscape could have been a shallow river bed with a tendency to shift the alluvial sand into islands. This feature could have been important when crossing the river and known as a perspective spot for fishing. It would be difficult to determine if it was similar in prehistoric times, yet this assumption should be taken into consideration when reconstructing the camping place selection in Stone Age. It must be noted that the toponym and hydronym 'Saliai' ('*Islands*' in English) show the importance of the river islands and most likely implicate their archaic dating.

After a small depiction of the site published by P. Tarasenka, the lithic assemblage contained a lot of artefacts. However, as the collection was not found in any of the museums, no further interpretation could be done. There was only several flint finds collected in Kleboniškiai village, a Swiderian type point as well (Fig. 111:9), yet most likely it has no relation to the collection described by P. Tarasenka.

Samantonys 1 site

Just as many sites along the river Neris, a Stone Age site in Samantonys village was discovered in the early 20th century by P. Tarasenka[228] and was later visited by K. Jablonskis and his daughter R. Jablonskytė. Withal, it was one of only several sites in the river Neris basin which were later excavated and yielded more archaeological information than the sites where only surface finds were collected[229]. Therefore the archaeological data from Samantonys became well known and gets attention from Lithuanian archaeologists even up to this day[230].

Back in the late 30s at least two separate Stone Age sites were localized on the left bank of the river Neris, where its tributary Korubis (previously

[228] Tarasenka, P., 1922, Ieškojimai neries ir Šventosios santeklyje / In: Mūsų senovė, Vol. 1, book No. 4–5, Kaunas, p. 586.

[229] Римантене, Р. К., 1960, Стоянка каменного и бронзового веков Самантонис / In: Советская археология, Vol. 2, Москва, p. 115–127.

[230] Akmens amžiaus gyvenvietės rekonstrukcijos galimybės Samantonių kaime, Conference, 2017 July 20th, Kurtuvėnai, Lithuania.

named Akūnia) ran out of a previously existed small lake and crossed the big sands in Samantonys village territory (Map 38 (R)). According to the local inhabitants of today, the place was very beautiful, yet very hard to live in, as the sand cover was unstable until the forest had grown, and the previously existed lake peat was the only fertile zone.

An interesting fact was that the village was situated in a territory where the so called Vepriai asteroid had fallen 150 millions of years ago. However, the crater of nearly 30 km width was covered by Quaternary sediments and in Final Palaeolithic did not stand out from the rest of the Neris basin landscape.

The Samantonys 1 site was very rich with archaeological finds – lithic artefacts and pottery fragments. Archaeologists from Kaunas Town Museum Pranas Baleniūnas and Rimutė Rimantienė investigated the site in 1943. On the basis of flint tool typology few stages of settling were determined: Bronze Age stage and some earlier stage, which was dated to Late Mesolithic. The latter interpretation was based on the theory, which had only partly been proved, that the settling of the river terraces had a direct relation with the climatic changes, river valley formation stage and water level fluctuations. In that case R. Rimantienė related the site on the first river Neris terrace to the chronologically later period than Litorina transgression, therefore it was thought the place could have been inhabited only in Late Mesolithic[231]. However, later the dating was revised and a small area in Samantonys was ascribed to Epi-Palaeolithic and was related to the begining of the Yoldia sea formation perdiod[232].

The previous scientific interpretation of the lithic assemblage was partly correct as the finds indeed were of some different settling stages. However, even after excavating part of the site it was difficult to ascribe some of the artefacts to one or the other period. In the last years the collection of Samantonys sites was kept in two separate places – in Kaunas Vytautas the Great War Museum and in National Museum of Lithuania. Thus, the

[231] Римантене, Р. К., 1960, Стоянка каменного и бронзового веков Самантонис / In: Советская археология, Vol. 2, Москва, p. 115–127.

[232] Rimantienė, R., 1984, Akmens amžius Lietuvoje, Vilnius, p. 61, 63.

conjunction of the lithic assemblage was complicated, but its revision has let to form an altered vision of the primary site settling.

The lithic assemblage contained not only various types of flint tools which could have been typologically related to some chronological stages, but also a small collection of flint implements and blanks produced from a brownish color flint nodule. The collection, after assembling it from the scattered boxes in two museums, allowed to put some changes in the interpretation of the very first visitors of Samantonys site (Fig. 85), as the brownish flint tools were previously interpreted separately and were ascribed to both – Mesolithic and Bronze Age assemblages[233]. However, as two Ahrensburgian type of points were made of the same brownish flint, it could be presumed, that all the other lithics produced from the same nodule could be dated to Final Palaeolithic and be seen as a tool kit of one particular group of people (or a person) which had visited the place on the river Neris bank with a purpose to hunt and treat the prey. The collection contained two points, 5–6 scrapers, several burins, some retouched or utilized blanks and a few blades produced from a double-platform core. One point was rather wide and reminded of the arrows made by Bromean tool producing technology. Perhaps this artefact had led some archaeologists to a disagreement which culture the assemblage from Samantonys should be ascribed to. According to A. Girininkas, the site was Ahrensburgian (Map 14), whilst E. Šatavičius interpreted it as Brommean (Map 18). However, as the two points should most probably be ascribed to one kit produced from one flint core, most likely they could be typologically related to Ahrensburgian culture.

The tools mentioned above were most likely made in a rather quick manner, at the site, after bringing a flint nodule from somewhere else. These presumptions could be made as the high quality brownish flint looked like an imported material in the context of grey Baltic type of flint, usual for all Stone Age settlements in Lithuania.

The Ahrensburgian collection of implements could belong to the very first inhabitants of Samantonys site. However, several implements made from

[233] Римантене, Р. К., 1960, Стоянка каменного и бронзового веков Самантонис / In: Советская археология, Vol. 2, Москва, p. 115–127.

brownish flint flakes could have been made by later inhabitants, even if originally the blanks had been produced by their predecessors.

It could be presumed that nearly at the same time the place was visited by other Final Palaeolithic group of people who had a tool assemblage made using Swiderian technology. Probably the most outstanding implement was a tanged point, typical for Early Swiderian culture (Fig. 84:1) (though it is missing and was studied only on the basis of its drawings), which could lead to a presumption that the site was visited at some point in the Younger Dryas. The lithic collection which remained after that stay could contain at least part of the burins and scrapers made from semi-regular blades produced from unipolar and double-platform cores, and also some implements of non-determined function, whilst some of the artefacts could relate to Neolithic or Bronze Age assemblage (Fig. 86–89). The Swiderian tool kit was more numerous than the Ahrensburgian one. Assumedly it was a bigger group of people or they had stayed at the site for longer, though the purpose of the stay was probably the same – hunting and prey treatment. Differently from other Swiderian sites in the river Neris basin, nearly all scrapers in Samantonys were of middle size (1,0–1,8 cm width), and no massive implements were discovered. Therefore an interpretation could be done that there were no big flint nodules to produce cores from, or the material which had to be scraped, was in rather small pieces (maybe furs of some small-middle size animals). What is more, decortication flakes were not numerous, therefore it could be presumed that prehistoric people had most likely brought flint cores, which were prepared beforehand. There were almost no big flakes found too. However, that could have been the result of later visitors, who might have used it for their tool making.

One scraper was made from a crested blade (Fig. 86:11), thus the blades could have been more preferable blanks for scraper making than flakes. This technological point would also fit a Swiderian manner of tool making based on blade producing. Therefore this presumption would support the hypothesis that a bigger part of the implements made from blades at Samantonys site could be ascribed to Final Palaeolithic instead of Bronze Age.

Samantonys 2 site

The history of site discovery was the same as of Samantonys 1 site, as both sites were situated in one sandy area, but were separated by a small river Korubis (see section *'Samantonys 1 site'*). However, that side of Korubis stream was not ever excavated and only surface finds could have been analyzed. Samantonys 2 site was also identified as multi-layered, yielding some Neolithic–Bronze Age artefacts as well as some earlier archaeological data, yet the lithic assemblage was a bit different from the one collected at Samantonys 1 site.

A big part of the flint finds collection (mostly flakes) were affected by high temperature, thus assumedly a prehistoric fireplace could have been situated somewhere in the area. In general, lithic debitage was of various types and could have been related to different periods of site settling. Whilst semi-regular blades produced from double-platform cores could be more likely ascribed to a Final Palaeolithic assemblage, some regular blanks made by knapping unipolar cores could be related to Mesolithic or Neolithic period. Flint cores were used almost completely, therefore presumably there were at least one or several flint knapping zones at the site, and the amount of flint material was most probably limited. Nevertheless, flint quality was quite good, as it was common to the territories a few hundreds of kilometres southwards, in south Lithuania, where flint material sources were situated. Probably prehistoric people had brought the material to the site and produced tools afterwards.

However, part of the implements – e.g. scrapers with utilization marks on the sides or retouched sides – would rather suggest that some tools were handled. Thus, they could have been made beforehand and brought to Samantonys site or show that the people had stayed at the site longer and had time to make their handled tools. However, the collection of burins would rather propose a different opinion about the camping duration: those implements were made in a quick manner, almost without choosing a favorable blank and were

not handled, therefore it looks like the people had no time for producing the burins or did not mind the particular form or shape of these tools. This manner of burin making could be seen even in the small brownish flint tool assemblage at Samantonys 1 site (which was related to Ahrensburgian archaeological culture), and could be generally defined as a feature of both Samantonys sites.

Typologically the most important finds at Samantonys 2 site were fragments of points which could be related to Final Palaeolithic settling stage, Ahrensburgian archaeological culture (Fig. 90). However, these implements were not produced from the same brownish flint as the tool kit from the other side of Korubis stream. Therefore it would be difficult to determine if the sands in Samantonys were visited by people who used Ahrensburgian tool producing tradition for one time or several times repeatedly. Also the relation between Samantonys 1 and 2 sites would then be under consideration: both sides of the Korubis river could be interpreted as two parts of the same one site, as well as to two separated sites (regardless of the Neolithic and Bronze Age settling remains).

Some artefacts made of decortication flakes and blades (Fig. 91:1–3, 93:1, 5, 11, 94:17, etc.) could typologically be ascribed to one tool assemblage most probably dating to Final Palaeolithic, as part of them were made from blanks produced by knapping double-platform cores (though the blanks could have been produced from several different cores). These implements should be related to the hunted prey treatment activity.

It would be worth to mention that some Palaeolithic implements, particularly big scrapers (Fig. 91), looked similar to the ones found in Kernavė 1 site, though they were a bit smaller. Both sites were situated in a distance of 32 kilometres (almost twice more if going along the rivers) and presumably could have been visited by similar or even the same groups of people in Final Palaeolithic. There are also some other artefacts which could be analyzed as having similarities with the finds discovered in other sites in the river Neris basin: a blade fragment with retouched notches on both sides (Fig. 94:13)

could be interpreted as being of the same type as a notched blade from Skaruliai 1 site (see section *'Art'*).

A big part of the tools of other function were made from semi regular and regular blades mostly produced from unipolar cores. Typologically their dating was almost impossible to determine, therefore some part of them should most probably be related to the later stage of settling (Fig. 94–95). What is more, there were quite a big amount of proximal fragments of the blades. This feature could be related to some particular technological character of tool making, however, it was not clear if these finds should be ascribed to the Final Palaeolithic assemblage, or not.

***

To sum up, Samantonys village was first settled in the Final Palaeolithic where a sandy area on both sides of a small stream Korubis were an attraction zone for at least several different groups of people who camped here and were in the area with a purpose to hunt and treat their hunted animals. R. Rimantienė, who investigated the archaeological material kept in her father's K. Jablonskis collection, noticed that Samantonys finds had similarities with Saleninkai site[234] which was around 13 km away to the west–southwest. However, having in mind only the earliest finds assemblages, these two sites differ. In Final Palaeolithic–Early Mesolithic Saleninkai site was mostly visited by Swiderian archaeological culture people, while Samantonys was most probably visited by both – Ahrensburgian and Swiderian groups of people for several times.

Some big implements and blanks show that the cores knapped in Final Palaeolithic should have been rather big, therefore the flint debitage left by the first settlers could have been plentiful. However, as the site was revisited in Neolithic and Bronze Age, some of the earlier assemblage could have been re-used and therefore the view of the actual Final Palaeolithic lithic collection could be inadequate.

[234] Римантене, Р. К., 1960, Стоянка каменного и бронзового веков Самантонис / In: Советская археология, Vol. 2, Москва, p. 115–127.

The area was convenient to be settled because three types of water bodies surrounded the sands: a small lake and a stream which run into a big river. Yet, if in Final Palaeolithic the big river Šventoji and its tributary Korubis intersection was most probably a landscape feature of attraction, in Neolithic or Bronze Age the fertile zone around a small lake also had to play an important role. By all means that zone was much wider thousands of years ago and was later partly covered by Aeolian processes. This presumption could be supported by the information gained after some sediment drilling and digging in the settled territory: the peat layer appeared to be covered by at least 1 metre of sand and yielded an artefact – an axed piece of a wooden log (not dated).

Semeniškiai site

Semeniškiai village on the right bank of the river Neris has been known to yield some flint artefacts dating to Final Palaeolithic for three decades already. However, after excavating some parts of the area, no exact location of the site was determined[235] and the flint finds typical for Final Palaeolithic – a double-platform core, Swiderian point and some retouched and utilised blades, etc. – could only be interpreted as random finds (Fig. 96).

It could be presumed that a Final Palaeolithic site (or few separate sites) should have been somewhere in the southern part of Semeniškiai village, on the second terrace of the river Neris, around 7–10 m above the river water level, in the area where a small stream runs from a previously existed lake Padvarinis (Map 32 (K)). Assumedly, the site was situated somewhere very close to the small river and could still be searched for in a distance of 150 m from it, perhaps near the intersection of the lake and the small river, on its right bank, or close to the third terrace of the river Neris border.

Skaruliai 1 site

[235] Luchtanas, A., 2005, Žvalgomieji archeologiniai tyrinėjimai Kernavėje, Pajautos slėnyje / In: Archeologiniai tyrinėjimai Lietuvoje 2002 metais, Vilnius, p. 31.
Vengalis, R., 2006, Semeniškių 2-oji neįtvirtinta gyvenvietė / In: Archeologiniai tyrinėjimai Lietuvoje 2004 metais, Vilnius, p. 58–61.
Vengalis, R., 2009, Semeniškių neįtvirtintos gyvenvietės / In: Archeologiniai tyrinėjimai Lietuvoje 2008 metais, Vilnius, p. 81.
Baltramiejūnaitė, D., Vengalis, R., 2010, Tyrinėjimai Semeniškėse / In: Archeologiniai tyrinėjimai Lietuvoje 2009 metais, Vilnius, p. 98–105.

The first Stone Age finds in Skaruliai village, on the left bank of the river Neris were recorded in the mid 20s by P. Tarasenka[236]. Some years later the place was visited many times by K. Jablonskis and R. Jablonskytė (Rimantienė)[237], and a large assemblage of flint artefacts was collected from the sandy surface in an area of around 1 km length[238]. It contained many interesting artefacts, however, the archaeologists did not find it reasonable to excavate the site as it was situated in large sands which were affected by Aeolian processes[239]. After publishing the most valuable part of the collection in the early 40s, it became one of the well known Swiderian sites in Lithuania as well as in Northern Europe, and was mentioned in the overwhelming Final Palaeolithic archaeology works[240]. Unfortunatelly, at about the same time, in 1962, a huge 'Achema' manufactory building was iniciated in the territory on the left bank of the river Neris, including the area where Skaruliai 1 site was discovered. Back in the late 20th century R. Rimantienė has organized a survey with an aim to rediscover the site and to investigate it further[241]. 56 m^2 were excavated in test pits in the territory where the site had to be situated. However, the expedition ended with no results, therefore the site was considered as completely destroyed by manufactory and highway building. Yet an opinion still exists that the site could have been located in a bit different place therefore was not rediscovered[242].

[236] Tarasenka, P., 1924, Panerio pirmykštės kultūros sėdybos (Nuo Kernavės iki Kauno) / In: Kultūra, Mėnesinis iliustruotas mokslo populiarus žurnalas su „Daigų" priedu, No. 7–8, Kaunas, p. 309.

[237] Jablonskytė, R., 1941, Akmens amžiaus stovykla Skaruliuose (Jonavos vls., Kauno apskr.), Vytauto Didžiojo kultūros muziejaus metraštis, Vol. 1, Kaunas, p. 3–4.

[238] Jablonskis, K., Survey diaries, Archive of the Lithuanian National Museum, Department of Archaeology, Vilnius.
K. Jablonskis collection in the National Museum of Lithuania, Vilnius.
Rimantienė, R., 1974, Akmens amžiaus paminklai / In: Lietuvos TSR archeologijos atlasas. Akmens ir žalvario amžiaus paminklai, Vol. I, LTSR Mokslų akademijos istorijos institutas, Vilnius, p. 11, depiction No. 306.

[239] Jablonskytė, R., 1941, Akmens amžiaus stovykla Skaruliuose (Jonavos vls., Kauno apskr.), Vytauto Didžiojo kultūros muziejaus metraštis, Vol. 1, Kaunas, p. 4.

[240] Taute, W., 1968, Die Stielspitzen-Gruppen im Nördlichen Mitteleuropa. Ein Beitrag zur Kenntnis der späten Altsteinzeit / Fundamenta, A-5, Böhlau, Verlag, Köln, Graz, p. 158, Fig. 158–159.
Римантене, 1971, Палеолит и мезолит Литвы, Вильнюс, p. 39, 45, 48–50, 70, 93.
Rimantienė, R., 1974, Akmens amžiaus paminklai / In: Lietuvos TSR archeologijos atlasas. Akmens ir žalvario amžiaus paminklai, Vol. I, LTSR Mokslų akademijos istorijos institutas, Vilnius, p. 11, depiction No. 306.
Rimantienė, R., 1984, Akmens amžius Lietuvoje, Vilnius, p. 27–28, 30–31, 33, 48, 56, Fig. 8 and 28.
Girininkas, A., 2009, Lietuvos archeologija: Akmens amžius, Vol. 1, Vilnius, p. 20, 46, 59–60, 85, 93.

[241] Rimantienė, R., 1997, Skarulių senovės gyvenvietės, Jonavos miestas, archeologinių žvalgomųjų tyrinėjimų 1997 metais ataskaita, Archive of the Lithuanian Institute of History, file No. 2817, Vilnius, 15 p.

[242] Šatavičius, E., 2017, Stipriai suardytų archeologinių vietovių tyrimai: Skarulių atvejis, presentation in a conference 'XIV Marijos Gimbutienės skaitymai', April 12.

At the time of the site discovery K. Jablonskis and his daughter had distinguished three find places in Skaruliai sands, they were separated by sand dunes with no artefacts. The lithics found in each of the places were sorted and analyzed separately in this study.

The first sandy area yielding flint artefacts in Skaruliai was about 850 m to the southeast from the river Neris flow, on its first terrace (Map 27 (F)). The site was located around 2 km away to the southwest–west from an intersection of two big rivers – Neris and Šventoji. The nearest tributary which was running into the river Neris was a small stream called Lankis, situated quite far away, around 1350 m to the southwest from the site. On the other side of the river, relatively in front of Skaruliai, Gudžioniai Final Palaeolithic site was localized.

The assemblage of archaeological finds collected in the first find place contained a lot of lithics, some fragments of pottery and burnt bones. They were of some different periods and had mixed in the sand due to bioturbations. Flint finds were typologically sorted into several assemblages, out of which the earliest one, presumedly dating to Final Palaeolithic–Early Mesolithic, was analyzed in this study. Significantly, it was the largest part of the collection. However, as some of the implements were of non-determined type or could be ascribed to several different periods of Stone Age, they were also taken into account as possibly belonginng to the tool kit of the first inhabitants.

As it could be seen from the lithics, mostly good-to-high quality flint material was used at the site, though also some nodules of poor quality flint with inclusions were taken for tool production. The artefacts were patinated by various intensity of patina, and previously some attempts were put to sort them into chronologically different assemblages by this criteria[243]. However, as the finds were collected from the surface after being affected by many postdepositional factors, this characteristic was considered as only partly reliable.

[243] Jablonskytė, R., 1941, Akmens amžiaus stovykla Skaruliuose (Jonavos vls., Kauno apskr.), Vytauto Didžiojo kultūros muziejaus metraštis, Vol. 1, Kaunas, p. 4–5.

Part of the artefacts were affected by high temperature, thus it could be presumed that it was resulted by some fire which could have been made at the site in prehistoric times.

Together with many flakes collected in Skaruliai first find place a lot of blades were found. They were of various sizes, widths and lenghts. As it could be reconstructed from the negatives of the blanks, both – double-platform and unipolar – types of cores were utilized for blade production. The majority of the blades were semi-regular or non-regular, many blanks had a distal tip curved to one side. This type of blades was common in Final Palaeolithic and Early Mesolithic. It seems that the blade production technology was very developed. Also a small quantity of tiny fragmented blades were discovered. They could be ascribed to Mesolithic stage of site settling as the technology they were produced with reminds of the one used for making microliths. The differences between non-regular and regular blade production technologies were noticed already in the early 40s by R. Rimantienė[244].

A lot of blanks found at the site were of very good quality and would have been suitable for implement production, however, they had no working or utilizing marks. A lot of flakes and blades were with retouched or utilized margins, also some burin-like cutting angles formed. Therefore it could be assumed that tool production was not or at least not always was a thing of a first importance. Rather, only the particular edge or angle was formed instead of creating a complete 'design' of a tool.

As it could be reconstructed from the blanks and core correction flakes, the cores used at the site were large and precisely formed. The assemblage of cores found at the site contained multidirectional as well as double-platform and unipolar cores. They were used up to a different level – some of them completely, until only a small piece of flint was left (they could be presumedly ascribed to the later stage of settling), whilst other cores seemed to still could have been used for flaking. Many core correction flakes as well as some partly worked flint nodules discovered at the site have shown that the flint knapping

[244] The same.

activity took place at the site for multiple times and, presumably, by several different people.

The collection of flint tools was of a great variety. Comparing to other sites along the river Neris, Skaruliai 1 site yielded a lot of points (Fig. 97, 103). Moreover, most of them were discovered in the first find place, which was not big – around 5 square metres. The majority of points and their fragments could be ascribed to Swiderian type, as their tang parts had flat retouch on the ventral side. They were made of non-regular and semi-regular blades produces from double-platform and unipolar cores. The tip of a point was usually formed on the distal part of a blank, and, with only a few exceptions, they were not formed in some particular manner. However, the latter impression could be misleading as a lot of points had their tip lost.

Most of the points were leaf form and, differently from the points discovered at Eiguliai 1 site, had a bit wider medial part. Some points were of a bit curved profile. Similar points were common to some sites in Southern Lithuania (e.g. Rudnia site) and Poland (e.g. Osowiec site) or even Ukraine (Berezhcy 3 site)[245]. Back in the early 40s, just after the collection was examined for the first time, R. Rimantienė ascribed these points to the Mesolithic (as chronology of Lithuanian Stone Age was still being constructed) Elongated Points culture and considered the flat retouch applied on the ventral side of the tang as an impact of Solutrean industry. However, after comparing Skaruliai site points with the ones found in Puvočiai site (Southern Lithuania), she concluded that they were not typically Swiderian. The interpretation was basically correct, as the points found in Skaruliai were of a Late Swiderian type[246].

The points with a tip formed by a marginal retouch from the ventral side could be ascribed to one group (Fig. 97:8, 33, 35). They were made from non-regular blades. Most archaeologists relate this type of points to the so called Post-Swiderian cultures identified in the territories to the north–northeast from

[245] Sulgostowska, Z., 1989, Prahistoria międzyrzecza Wisły, Niemna i Dniestru u schyłku plejstocenu, Warszawa, Państwowe Wydawnictwo Naukowe, p. 164, Fig. IV:3; p. 181, Fig. XXI:9; p. 187, Fig. XXVII:2, 4–5, 8.

[246] Šatavičius, E., 2001, Vėlyvojo paleolito kultūros ir jų likimas ankstyvajame mezolite / Doctoral dissertation, Vilnius University, Vilnius, p. 111–113.

Lithuania: Finland, Russia[247]. According to T. Ostrauskas some implements typical for Kunda culture could be identified in Skaruliai site assemblage[248]. Most probably what he had in mind was a fragmented point similar to Pulli type (Fig. 97:28) and the previously described points with retouched tips. However, the points made by Kunda technology were usually made from very regular blades and their tips were formed not by marginal retouch, but by flat retouch from the ventral side instead, applying it on a wider area of the ventral surface of the blank distal part[249]. Whereas some points in Skaruliai site could presumably be of some transitional type from Swiderian technology to Kunda. Thus, on the basis of typological distinction, they could be dated to the very beginning of Early Mesolithic. Meanwhile it would be worth to mention that R. Rimantienė has previously related this type of points to some introduction of Neolithic technology[250], however, this dating would be far too late.

There were also points of other types present in the collection. They stood out from the rest of the assemblage which was on the main part considered as Swiderian. One of the non typical points was formed with marginal retouch applied to the tang and tip from the dorsal side (Fig. 97:36). It could only be presumed that the missing tang was worked in Swiderian manner, however, if not, this implement could be also ascribed to Ahrensburgian type. Another point was similar to the so called 'backed blade' of Federmesser type. It was made from a blade and had one margin retouched (Fig. 97:31). It was either patinated by a quite thick layer of patina, or it was made of some different sort of flint material, which could be called a siliceous rock. Whereas the arrises of retouch negatives were polished due to some utilization or post-depositional effect. In a 'Swiderian-like' context this point stood out by all means, it seemed to be an early artefact. Typologically it is similar to the so called *Rückenspitzen* points

[247] Personal consultation with Dr L. Zaliznyak, 2013.
Kozłowski, S. K., 1975, Cultural Differentiation of Europe from 10th to 5th Millennium B.C. (Zróżnicowanie kulturowe Europy w X-V tysiącleciach P.N.E.), Warsaw, p. 211, Fig. 23.
Kozłowski, S. K., 1980, Atlas of the Mesolithic in Europe (First Generation Maps), University of Warsaw, p. 21, 31, Fig. 63–67.

[248] Ostrauskas, T., 2002 (1), Kundos kultūros tyrinėjimų problematika / In: Lietuvos archeologija, Vol. 23, Vilnius, p. 95, Fig. 1:35.

[249] Ксензов, В. П., 2006, Мезолит Северной и Централной Беларуси / In: Материалы по археологii Беларусi, No. 13, Minsk, p. 61, 149, Fig. 64:21–22.

[250] Jablonskytė, R., 1941, Akmens amžiaus stovykla Skaruliuose (Jonavos vls., Kauno apskr.), Vytauto Didžiojo kultūros muziejaus metraštis, Vol. 1, Kaunas, p. 7.

which are usually ascribed to Federmesser group, yet sometimes are found in Ahrensburgian sites[251]. The archaeologists have different opinions on the interpretation of this find. A. Girininkas would relate it to Federmesser culture[252], while E. Šatavičius described it as a microlith which had nothing in common with Final Palaeolithic cultures[253]. Whereas R. Rimantienė has changed her opinion throughout the years: back in the early 40s she admitted that it was not typical for Swiderian culture and it could be dated to even earlier period of Palaeolithic[254], however, after three decades she described Skaruliai site as yielding only Swiderian artefacts[255]. At the first sight it would remind a microlith (a lancet), especially if evaluated only by looking at its drawing. However, it was formed out of a non-defined flint blank as it could either be a flake or a piece of blade. Thus, it was not evident whether a blade production technology was used. No microburin division marks were visible as well. The back of the tool was retouched from the dorsal and the ventral sides, in that way a sort of 'additional' plane was formed and the tool became of triangle profile. Therefore a more important part of the implement was a sharp tip, not the retouched margin. However, the early dating of this point should be considered reservedly, as there was another very similar tool found in the collection (Fig. 97:32). Yet it was of a bit curved profile and was not patinated so intensively. Thus, these two tools could be either interpreted as different or be ascribed to the same type. In the latter case, they could be both related to Federmesser culture or to some Mesolithic culture.

If there was a need to determine the existence of Federmesser archaeological culture on the basis of some other artefacts, discarding the points, some scrapers made of flakes and implements with retouched notches would be wanted. There could be some found, however, they would not be considered as typical. Therefore the backed point would implicate that a group of people (or a

[251] Probst, B., 1989, Rastplätze spätaltsteinzeitlicher Jägergruppen von Berlin-Tegel (mit einer Expertise von F. Scheingruber) / In: Ausgrabungen in Berlin, Nr. 8, Wissenschaftsverlag Volker Spiess Berlin, p. 124, Fig. 26:2–3.

[252] Girininkas, A., 2009, Lietuvos archeologija: Akmens amžius, Vol. 1, Vilnius, p. 45–46.

[253] Personal consultation with Dr E. Šatavičius, 2013.

[254] Jablonskytė, R., 1941, Akmens amžiaus stovykla Skaruliuose (Jonavos vls., Kauno apskr.), Vytauto Didžiojo kultūros muziejaus metraštis, Vol. 1, Kaunas, p. 8–9, Fig. 24.

[255] Римантене, 1971, Палеолит и мезолит Литвы, Вильнюс, p. 46, Fig. 33:12.

single person) who knew some other technology to produce points was present at the site. Yet it could have been of Federmesser, Ahrensburgian or of some other culture, dating to later period than Final Palaeolithic (e. g. Tarnów, Witów). Similar finds could be found in various Mesolithic sites outside of Lithuania, e. g. in Lubotin 3 site in Ukraine[256].

Another fragmented point had both margins retouched from opposite sides: the right one from the dorsal side, and the left – from the ventral side (Fig. 97:21). As the presumed tang part did not remain, it could only be assumed that it was retouched in Swiderian manner, yet it could have also been a fragmented drill. Whilst also some other artefacts that were ascribed to the points could be interpreted as drills (Fig. 97:2, 19), but a microwear analysis is needed to clarify their actual function.

One non typical point was basically retouched only on the right margin from the dorsal side. In this way presumably a one-sided tang was formed (Fig. 97:24). It also stood out from the rest of the points because its tip was formed on the proximal end of the blank. The way this point was made might be related to Ahrensburgian technology.

There was also one fragmented point with the ventral side missing as part of the implement had crumbled (Fig. 97:22). It was hard to determine if the remained part was of a tang or of a tip. Therefore it was not related to any of the archaeological cultures, as it could have been of Swiderian as well as of Ahrensburgian type.

At least several points had implicated an Ahrensburgian stage of site settling. They all had a tang formed by a retouch from the dorsal side only (Fig. 97:14–15, 16?, 17, 29–30, 38). Some of them had partly retouched margin of the tip. These points were relatively shorter than Swiderian ones. The tang was formed in the proximal part of the blank, which was usually a non-regular or semi-regular blade, produced from a double-platform or unipolar core. The bulb was not flattened, however, at some cases was removed with one flake. This manner of tang forming was common to the

[256] Zaliznyak, L., 1997, Mesolithic Forest Hunters in Ukrainian Polessye, BAR International Series, book 659, England, p. 19.

Eastern Ahrensburgian – Krasnoselye culture. Similar points were discovered in Poland, Rotnowo 18 site, which was dated to Younger Dryas[257]. Thus, it might be assumed that this technology was introduced to the river Neris basin territory from south-southwest. One of those points could be also interpreted as Brommean due to its comparatively rough proportions (Fig. 97:14).

The Ahrensburgian points found at Skaruliai first find place were much fewer than Swiderian, yet it would be difficult to determine the exact number of Ahrensburgian artefacts. The wide variety of point types in Skaruliai implicates a multiple settling of the site in Stone Age. Moreover, it showed that the sandy place on the river Neris bank was visited for at least two or three times in Final Palaeolithic. Presumably the place was a meeting point of some related groups of people or was visited as a strategically convenient place for hunting.

The lithic collection of Skaruliai first find place also contained a number of scrapers and their fragments (Fig. 98). The majority of those artefacts were made from non-regular and semi-regular blades produced from double-platform and unipolar cores. Only some scrapers were formed from very regular blades. Also flakes were used for the production of small scrapers (part of them could be related to Neolithic). Several scrapers had a wide working edge, whilst also some very tiny implements were present. Thus it might be presumed that the material worked at the site was also of great variety and differed in thickness. Some of the scrapers were affected by very high temperature and therefore had cracked into indefinable fragments.

Only several tools stood out from the collection. One scraper was most probably made to be handled, it reminded the *Wehlen* type of scrapers common to Ahrensburgian tool making technology (Fig. 98:26). It was formed on a blank produced from a double-platform core. Noticeably, the side margins were utilized much more intensively than the presumed scraping edge on the distal part of the tool.

[257] Galiński, T., Sulgostowska, Z., 2010, Younger Dryas Tanged Point Key Sites in Western Pomerania / In: Archaeologia Baltica, Klaipėda, Vol. 13, Fig. 4:4.

Another interesting scraper was with a retouched notch on the left side of the blank (Fig. 98:13). It could have been done for handling or for some other purposes, e. g. the notch could have also been used for scraping some wooden stick or piece of antler. The collection also contained a scraper which was certainly used by keeping it in the right hand (Fig. 98:33), thus it implicated that a right-handed person was camping at the site.

Presumably some implements of non-determined type could have been also used for scraping. It has to be noted that some part of the scraping tool assemblage should probably be related to later periods than Final Palaeolithic.

The tool kit of the first inhabitants contained more than twenty cutting tools, mostly burins (Fig. 99), which were used and corrected for multiple times. Burins were made from flakes and non-regular blades, also from core reparation flakes. Some of them were bidirectional, whilst others were utilized in one direction. Around half of this assemblage was tools thoroughly made, whereas the rest were burins formed in a quick manner, without precisely selecting a blank to form a cutting angle.

The implements of non-determined function found in Skaruliai first find place were mostly made from various blades (Fig. 100–101). Also a partly polished axe was discovered (Fig. 100:24). However, it could be ascribed to some later periods than Final Palaeolithic. One tool produced from a core reparation flake had a unique form: three ‘spikes’ formed by marginal retouch from the dorsal side. It could have been used for engraving or scraping (Fig. 100:29). Yet probably the most interesting artefact found at the site was a notched blade (Fig. 100:1), which will be discussed later (see section *‘Art’*).

It should be also noted that the lithic collection also contained a number of artefacts typical for Middle–Late Mesolithic and Neolithic periods: microliths, points, etc. However, as the first stage of site settling was without a doubt related to Final Palaeolithic groups of visitors, they were not taken into consideration for this study.

To sum up, the sandy place in Skaruliai was very appreciated in Final Palaeolithic and was visited for many times. The main purpose of the visits

could have been seasonal hunting, and this activity might be directly related to the river and its valley, as the tributaries were quite far away from the site and were not the main point of attraction. Most probably, temporary campsites were established before hunting, tools were produced in situ, and the stay of the visitors had lasted as long as the hunt prey was butchered and treated. The small place in Skaruliai sands was visited repeatedly by different groups of people, and the gap between their visits could have been hundreds or even thousands of years. Therefore it might be presumed that the newcomers identified the place as convenient for camping because they could actually see the remains of the campsite of their predecessors, or the site stood out in the surrounding landscape, e. g. as a recess or a lee place.

The very first visitors of the site could have been Ahrensburgian group of people, yet also a small possibility remains that hunters of Brommean archaeological culture could have come even earlier. A bit later, possibly in the very end of Younger Dryas or the beginning of Preboreal some Late Swiderian people had camps there, until in Mesolithic the sands of Skaruliai were rediscovered by some Late Swiderian group of inhabitants, who might have known some flint knapping technology similar to the one of Kunda culture. Throughout the thousands of years the lithic assemblages left behind by all these settlers had mixed.

At least two Final Palaeolithic stages of site settling were distinguished already in early 70s, when the drawings of Skaruliai artefacts were analyzed by W. Taute[258]. Together with assemblages from Eiguliai and Drąseikiai sites the collection from Skaruliai was taken into account as references when investigating the Swiderian and Ahrensburgian cultures in Lithuanian territory. It should be noted that the archaeologist published the re-drawings of the artefacts, therefore some incorrections appeared in the literature: on some negatives of the finds the knapping dirrection was changed in 90° or even 180°, and some exact proportions of the artefacts were disregarded. Yet the

[258] Taute, W., 1968, Die Stielspitzen-Gruppen im Nördlichen Mitteleuropa. Ein Beitrag zur Kenntnis der späten Altsteinzeit / Fundamenta, A-5, Böhlau, Verlag, Köln, Graz, p. 158, Fig. 158–159.

main differences and similarities among the assemblages in various sites were noticed, and Skaruliai site was considered mostly Swiderian, but typologically a bit different from Eiguliai site[259]. Thus, several variants of Swiderian culture were distinguished in Lithuania and within the limits of a few dozen kilometres length of territory along the river Neris.

However, the first find place at Skaruliai 1 site should be interpreted as temporary, regardless of the exact stage of its settling in Final Palaeolithic. The large quantity of points implicate that the site was in a very special and convenient place, yet other implements, if divided into three or four separate assemblages related to each of the groups of visitors, would reveal that the site was not inhabited for a long time or by many people at once.

The second find place discovered in the sands of Skaruliai was located around 500 m to the west–southwest from the first find place. It was 315 m away from the river Neris flow, on the second terrace (Map 27 (F)). The small tributary running to the river was a bit closer to this place than to the first one, yet it was still around 1 km away.

The place yielded mostly Neolithic flint artefacts and only several finds could be interpreted as remains of some earlier stage of settling (Fig. 102). However, no typical tools were identified, thus, none of the artefacts could be taken as indicators for further determination of site chronology or relation to some archaeological cultures. The four artefacts implicated that a blade production technology was applied, while one artefact with a notch retouched on the ventral side (Fig. 102:2) could be reservedly related to the notched implements found at the first find place of Skaruliai 1 site.

Whereas the lithic assemblage collected in the third find place contained several implements which implicated site settling in Final Palaeolithic (Fig. 103). The place was situated around 300 m to the southE from the river, on the edge of the second terrace. A distance of about 160 m separated the second and the third find places (Map 27 (F)). There could be a slight chance that this part

[259] The same, p. 224, Fig. 158–159.

of Skaruliai 1 prehistoric site could still be not destroyed and might be investigated.

Flint artefacts discovered at the third find place were not numerous, yet they provided quite a lot of information. Four fragments of points, all of them tang parts, had implicated that the place was a spot chosen for hunting purposes. Three of the points were made in Swiderian manner and had a retouched ventral side of the tang in order to flatten the proximal end of the blank (Fig. 103:1–2, 6). However, on the basis of the chosen blank regularity and formation of the tang, they could be related to two different types of Swiderian points. Three of them might be ascribed to the Late Swiderian culture (Fig. 103:1–2, 6), yet could be related to more than one stage of settling. Two separate stages of Swiderian settling could seem too much for one small place on a river bank, yet to be accurate, it also yielded one fragment of a presumably Ahrensburgian point (Fig. 103:7). Therefore on the basis of typology it could be assumed that this place might have been visited for three times in Final Palaeolithic.

Other lithics collected in the third find place were mostly made from regular and semi-regular blades. One narrow scraper and two burins (Fig. 103:3–5) were interpreted as tools probably used for hunt prey treatment. Some retouched blades and a drill formed from a regular blade (Fig. 103:8–11) could implicate some other work that took place at the site.

In general two manners of flint knapping technology could be determined on the basis of visual analysis of the negatives of the blanks: semi-regular blade production using double-platform cores and regular blade production using unipolar cores. The latter might be related to Mesolithic.

To conclude, Skaruliai 1 site could be interpreted as a scattered site with three spots that were zones of activity. The most important one was the first find place that yielded the majority of lithics. At least two spots – the first and the third one – could have been occupied in Final Palaeolithic for multiple

times and by some different groups of people. Yet the interpretation of the second find place could be debated.

The site was occupied due to some hunting as well as prey treatment purposes, and was most probably abandoned soon after that work was done. The flint material found at the site was much better than the one available in the nearest surroundings, therefore it could be presumed that it was brought in nodules to the site and then knapped in situ.

The sandy left bank of the river Neris could have been one of the most important spots for reindeer hunting. On the other side of the river, a bit upstream, the lower reaches of a tributary Lokys were situated (Map 27 (F)). That place could have been a probable point where a reindeer herd could approach from the north, cross the river and reach the southern bank just where the Skaruliai campsite was situated. Thus, the site location would have been perfectly located in the case of hunting animals while they were getting out of the water.

Skaruliai 2 site

The site was located on the left bank of the river Neris, in a sandy place around 540 m to the southeast from its flow. At that point the river should have been flowing a bit more to the north, therefore it might be presumed that the distance between the river and the site was longer. It was situated on the second terrace above the floodplain, around 11 m above river water level (Map 27 (F)). To the west–northwest from the site, around 300 m away, a small tributary Lankis runs into the river Neris. The previously discussed Skaruliai 1 site was situated rather far away, around 800–1500 m to the north–northeast.

The site was discovered in the territory of Iron Age barrows (which were under State protection) a decade ago[260]. However, the majority of it was destroyed due to later human activity: Iron Age barrows, a village of recent centuries, manufactory 'Achema' activity, and mostly – by digging refuse pits. As a highway building project was initiated, the area had to be investigated

[260] Zimaitytė, E., 2008, Skarulių pilkapių vieta / In: Archeologiniai tyrimai Lietuvoje 2007 metais, Vilnius, p. 114–117.

archaeologically. Unfortunately, at first it was excavated not properly, and the Stone Age site remains were only partly recorded. Therefore the excavation was taken over by E. Šatavičius[261]. An area of more than 6000 m^2 was investigated and yielded nearly three thousands of flint artefacts. Also a few prehistoric features have been unearthed. In this study a preliminary view of the earliest stage of site settling is presented on the basis of the available archaeological data which had remained and was recorded.

The artefacts which could be ascribed to the Stone Age cultural horizon – flint finds and burnt bone fragments – were recorded in the medium grained sand layer, as well as in the disturbed soil (~30%), therefore the exact distribution of lithics could not be determined, yet was reconstructed to as close a view as it was possible. The presumed Stone Age horizon was unearthed in 0,3–2,0 m depth. Some concentrations of lithics could be distinguished (Fig. 174). The spatial distribution of the flint finds was analyzed on the available archaeological data. Yet it has to be noted that the exact location of a big part of the artefacts was not recorded as in the first season of the site investigation inappropriate excavation methods were applied and many finds were missed.

As it could be assumed from the lithic assemblage, the flint material used at the site was taken from local surroundings as well as brought from some sources situated further, yet a different flint sourcing economy could have been applied in earlier and later stages of site settling as it was also occupied in Neolithic.

Many decortication flakes collected at the site implicate that the cores were produced in situ. Also a big part of debitage was flint flakes and knapped pebbles of poor quality, with many inclusions and cracks. It seems that those were the nodules found in the closest vicinity.

On the basis of the negatives of the flint finds the character of flint

[261] Marcinkevičiūtė, E., 2011, Skarulių pilkapių vietos tiesiant Jonavos pietrytinį aplinkkelį (kelio A6 Kaunas-Zarasai-Daugpilis 32,7-32,9 km ruožas) archeologinių tyrimų 2009-2010 m. ataskaita, Archive of the Lithuanian Institute of History, file No. 91228, Vilnius.
Šatavičius, E., Marcinkevičiūtė, E., 2011, Skarulių pilkapių vietos tyrimai 2009–2010 metais / In: Archeologiniai tyrinėjimai Lietuvoje 2010 metais, Vilnius, p. 102–113.
Marcinkevičiūtė, E., Šatavičius, E., 2013, Skarulių pilkapių vietos tyrimai / In: Archeologiniai tyrinėjimai Lietuvoje 2012 metais, Vilnius, p. 23–26.
Marcinkevičiūtė, E., Šatavičius, E., 2014, Skarulių pilkapių vietos tyrimai / In: Archeologiniai tyrinėjimai Lietuvoje 2013 metais, Vilnius, p. 23–27.
Marcinkevičiūtė, E., Šatavičius, E., 2015, Skarulių pilkapių vietos tyrimai / In: Archeologiniai tyrinėjimai Lietuvoje 2014 metais, Vilnius, p. 57–62.
Šatavičius, E., 2017, Stipriai suardytų archeologinių vietovių tyrimai: Skarulių atvejis / presentation at the Conference 'XIV Marijos Gimbutienės skaitymai', Vilnius.

knapping was reconstructed. Various forms of the cores were used for blade and flake production. Semi-soft as well as soft percussion technique was applied to unipolar and double-platform cores, whilst amorphous ones were also intensively used. In some cases the flint knapping direction was changed in 90°. At least two different types of blades implicate at least several different stages of settling: the semi-regular and non-regular wide blades produced from double-platform cores would show a Final Palaeolithic manner of flint knapping, whilst thin regular blades produced from unipolar cores would rather relate to some later, presumably – Mesolithic manner of tool production. Several microburins found at the site would also be ascribed to the later technology.

Most of the cores were completely used. However, it seems they were not large in the beginning of flint knapping process as well, as the longest blades would barely reach 10 cm length, and the diameter of a core plate found at the site was not wider than 5 cm. To add, the latter artefact was affected by a high temperature, as well as some regular blades discovered nearby. Thus, it could be presumed that the core was prepared and knapped at a fireplace.

Lithic assemblage contained a few hundred flakes and several dozens of blades, some of them very tiny, produced during a process of correction of the core arrises. A little part of the artefacts was affected by fire. A few of them were discovered in one of the deepest stratigraphical layers, therefore it could be assumed that they were in contact with fire not in the recent centuries, but in prehistoric times. The size and proportions of the blanks varied, the majority of them were fragmented. Most of the finds were patinated by a medium intensity patina.

The most numerous flint implements found at Skaruliai 2 site were scrapers (Fig. 104). They were mostly formed from non-regular blades, flakes and decortication flakes in particular. This feature could implicate a lack of flint material and was recorded only in several sites in river Neris basin (Radikiai, Rusiai, Saleninkai). Three of the scrapers were found within the limits of one square metre, thus, a probable spot where some hide scraping

activity took place might have been discovered around 5 m away from a presumed prehistoric hut (Fig. 174) (described further).

Only several burins were found at the site, they were used in two directions for a long time as evidence of multiple cutting angle correction was visible (Fig. 104:21, 22, 41). One of the burins was formed from a crested blade, while others were produced from semi-regular blades. Also some blanks with one burin-like strike mark on the side were found. They could have been used for cutting as well. Whereas some burin spall flakes implicate that there could have been more burins in the prehistoric toolkit than it was actually discovered. Also some drilling, cutting tools were present, as well as implements of non determined function. Some blanks were also utilized and had retouched margins. One particular tool had two notches retouched from the dorsal side (Fig. 104:23). It was made from a semi-regular blade. However, as only the proximal part of the implement has remained, it would be difficult to discuss its function. The forming of notches seemed to be quite common manner of the inhabitants of Skaruliai 2 site (Fig. 104:16, 23, 40). As some implements with notches were also identified in Skaruliai 1 site, the relation between these two sites might be taken into consideration.

The hunting and fishing tools were not numerous, only some fragmented tanged points and microliths were discovered. The latter were ascribed to the Mesolithic stage of site settling.

During the excavation a few prehistoric features were also unearthed and some lithic find concentrations recorded. According to E. Šatavičius, they could be ascribed to the earliest archaeological horizon of site settling.

A presumed prehistoric hut No. 1 was discovered in the northwestern part of the site. It was a recessed type of structure with several stone boulders most probably marking the entrance to the hut (Fig. 157–158). As it could be reconstructed from a partly excavated feature (the upper southwestern part of it was destroyed), the hut could have been 2,0–2,5 m wide and could have been recessed into the ground by at least 1,3 m. Thus, it might be presumed that it was dug in the warm season of the year, but was most probably prepared for staying

in it in some cooler or even harsh weather. Yet the recessed type of a hut should have been convenient throughout all the seasons of the year. Some concentration of flint artefacts was recorded within the limits of the presumed hut. Thus, some tool producing activity might have taken place indoors, and that could also implicate the use of the hut during a cold season.

In the same stratigraphic layer another feature was unearthed to the east from the presumed prehistoric hut No. 1. It was also a partly destroyed stain of orange sediment, which could be interpreted as a fireplace No. 1 (Fig. 158, 174). As it could be preliminary reconstructed, the fireplace was of around 1,2 m long and 1,0 m wide. Close to it some burnt flint finds were recorded. Many flint implements discovered in the closest vicinity of the hut and the fireplace show that some activity took place in that particular zone, it was identified as activity zone No. 1. Several metres away to the southeast another activity zone No. 2 was recorded. Three implements found in one square metre implicated that some scraper work was done in that particular spot.

At least four flint knapping zones could be distinguished on the basis of a preliminary plan of finds distribution. Two of them – zone No. 1 and 3 – were rather close to the hut, while other two were a bit further to the southwest and southeast (Fig. 174). The flint knapping zone No. 4 could be also considered as a place of tool production or some work/activity zone as well, as there was an accummulation of flint implements recorded.

On the basis of the tool typology several preliminary stages of site occupation could be distinguished. According to E. Šatavičius the very first stage was related to Swiderian culture and should be dated to Final Palaeolithic. Also some Mesolithic and Neolithic/Bronze Age settling stages could be determined, though the majority of finds common to these two periods were not discussed in this study.

The site was most probably inhabited in the very end of Final Palaeolithic by some group of people who used Swiderian technology of tool making. The prehistoric hut remains discovered at the site should most probably be related to it and could implicate that these people had stayed in Skaruliai for a longer

time. The site had stood out from the rest of the archaeological sites along the river Neris, as most probably the main purpose of occupying it was not hunting. Instead, some other activity related to hunted prey treatment, fur/leather working took place at the site. The fireplace, which could have been used for quite a long time, would also implicate a long-term stay.

The main natural point of attraction for site installing was the small tributary Lankis, while the intersection of two big rivers Neris and Šventoji one kilometre away to the northeast could have been a perfect spot to go hunting to. Therefore a relation between the two Final Palaeolithic Swiderian sites in Skaruliai territory might be discussed as presumably they could have been visited by the same people.

Stavidvaris site

See section *'Drąseikiai site'*.

Varpiai site

The site was discovered by K. Jablonskis, who collected some lithics from the surface during his visits to the site in 1937–1939[262]. According to the small descriptions kept in the National Museum of Lithuania, Varpiai site was situated on the left bank of the river Neris, around 1 km away from its flow, on the first terrace. Back in the mid 20th century it was a sandy mound surrounded by swampy fields. The site was located on the left bank of a small tributary Varpė (Map 26 (E)). However, in 1988 the site was mentioned in Cultural Heritage documents as not found[263] and was not protected.

The collection of lithics was previously analyzed by a few archaeologists, however, no archaeological data was published. There was only one interpretation given in the literature – the site was mentioned as Swiderian[264]. After an investigation of the lithic assemblage done in the recent years, it was presumed that the artefacts should typologically be ascribed to Final

[262] Rimantienė, R., 1974, Akmens amžiaus paminklai / In: Lietuvos TSR archeologijos atlasas. Akmens ir žalvario amžiaus paminklai, Vol. I, LTSR Mokslų akademijos istorijos institutas, Vilnius, p. 76, depiction No. 351.

[263] Respublikinis žemėtvarkos projektavimo institutas, 1988, Lietuvos TSR Jonavos rajono gamtos, istorijos ir kultūros paminklų katalogas, 2nd edition, Centre of Cultural Heritage, Vilnius, file No. 66.

[264] Girininkas, A., 2009, Lietuvos archeologija: Akmens amžius, Vilnius, Vol. 1, p. 59.

Palaeolithic–Early Mesolithic and Neolithic. The tool kit of the earliest inhabitants of the site contained several points. One of them was of an Ahrensburgian type, made of a long narrow non-regular blade (Fig. 105:1). The tang of this artefact was formed by breaking the blade in the proximal part and then applying regular retouch from the dorsal side on both – right and left – margins. The tip was also formed by retouching one of the edges.

Another point was of non-determined type (Fig. 105:2). It was made of a non-regular blade and had a distal left edge and proximal right edge obliquely retouched. Typologically this point would be close to the Zonhoven type. If this presumption is proved, it could be related to the same assemblage as the previously described Ahrensburgian point.

Also two fragments of the implements that could be interpreted as the proximal parts of the points were discovered (Fig. 105:3–4). One of them might be related to Swiderian type as the flat retouch was applied on the ventral side of the blank to form the presumed tang (Fig. 105:3). Four scrapers made of wide non-regular blades were also discovered at the site. The scraping edges of some of them were formed on the proximal end of the blank. Three burins and a few artefacts of non determined function were also ascribed to the Final Palaeolithic–Early Mesolithic assemblage (Fig. 105). A lot of blanks were utilized without retouching.

After taking into account all the lithics discovered in the site it can be presumed that both – one- and double-platform – cores were used to produce blanks for tool making. A part of the assemblage was of a very good quality flint material, whilst some flakes were produced from poor quality nodules with chalky inclusions. However, it seems that the flint was not abundant at the site, as most of the cores were used up until only the small pieces were left. The flint finds were collected from the surface; therefore they were covered by patina of various thicknesses. Some artefacts were impacted by heating.

The study of the lithic assemblage from Varpiai site has shown that the site was visited in the Final Palaeolithic or Early Mesolithic, and the stay was most probably short-term. The points of two different types – Ahrensburgian

and Swiderian – might be interpreted as belonging to two different groups of people or to the same one group, as the correlation between these two manners of flint arrow producing has already been under discussion for many years[265]. The variety of the implement types was the same as in the other Final Palaeolithic–Early Mesolithic sites along the river Neris. Presumably, prehistoric people had come to camp in Varpiai for hunting and stayed there until the prey was treated. After several thousands of years the site was revisited by Neolithic people and the flint artefacts mixed in the sand due to the post-depositional processes.

Vanagiškis site

The site was discovered and visited for a few times before the WW2 by K. Jablonskis. It was a sandy area of 80 x 50 m on the right bank of the river Neris, on its first terrace, around 370 m away from the river flow, approximately 12 m above water level[266] (Map 28 (G)). There were no tributaries running into the river in the surrounding area, but the site location was interesting – it was in between Neris and Šventoji rivers, where the distance between them was 2,5 km. In 2018 the site was revisited, it yielded some lithic debitage. Due to a very small collection of finds, it was difficult to determine when the site was visited for the first time – in Mesolithic or earlier. No further presumptions on the primary settling of the site could be done as well.

A bit closer to the river also Vanagiškis 2 site was known, yet a trapeze found there implicated that it should be dated to Mesolithic or Neolithic.

Vilnius 1 site

The site was discovered in the early 40s by K. Jablonskis during a survey expedition along the river Neris. Later it was visited for several times and the flint finds were collected from the sandy surface. Unfortunatelly, the site lasted barely a decade after its discovery, as it was later completely destroyed by building the Vilnius Heat Plant-2. Now the lithic assemblage is kept in the

[265] Šatavičius, E., 2001, Vėlyvojo paleolito kultūros ir jų likimas ankstyvajame mezolite / Doctoral dissertation, Vilnius University, Vilnius, p. 92.

[266] Rimantienė, R., 1974, Akmens amžiaus paminklai / In: Lietuvos TSR archeologijos atlasas. Akmens ir žalvario amžiaus paminklai, Vol. I, LTSR Mokslų akademijos istorijos institutas, Vilnius, p. 75, depiction No. 347.
Respublikinis žemėtvarkos projektavimo institutas, 1988, Lietuvos TSR Jonavos rajono gamtos, istorijos ir kultūros paminklų katalogas, 2nd edition, Centre of Cultural Heritage, Vilnius, file No. 66.

National Museum of Lithuania.

The site was situated on the left bank of the river Neris, approximately 340 m away to the east–southeast from its flow, on the edge of the third terrace, around 16–18 m above the river water level[267] (Map 37 (P)), in the southwestern part of modern Vilnius. After analyzing the old maps of 1940s no tributaries of the river Neris were identified in the closest vicinity to the site location. At that point the river was around 80 m wide.

According to R. Rimantienė, six spots where the flint finds were collected should be interpreted as one occupied area. Two spots were titled as Vilnius 1 and Vilnius 1a sites (separated by a ditch, therefore taken into consideration as one site), while another four spots were titled as Vilnius 2, Vilnius 2a, Vilnius 2b and Vilnius 2c[268]. The latter four spots were conjoined into one Vilnius 2 site collection (see section '*Vilnius 2 site'*). The two sites – Vilnius 1 and Vilnius 2 – were in a distance of 170–200 m from each other (Map 37 (P)). On the basis of similar lithic assemblage collected in both sites, R. Rimantienė considered the area as one Final Palaeolithic site[269]. In this study Vilnius 1 and Vilnius 2 sites were analyzed separately, yet were also interpreted as related.

The lithic assemblage collected at Vilnius 1 site was previously studied for several times and was brought into scientific discussion as one of the basic sites representing Baltic Magdalenian period and particularly Ahrensburgian culture[270]. Yet it has to be noted that in the detailed analysis made by E. Šatavičius the artefacts from 'Vilnius 1a' find place were then discarded. Also, the research was made partly taking the color of patina in consideration, whilst in this study the patinization factor was disregarded because many finds were exposed on the sandy surface for a long time.

As it could be reconstructed from the negatives of the flint artefacts and the

[267] Rimantienė, R., 1974, Akmens amžiaus paminklai / In: Lietuvos TSR archeologijos atlasas. Akmens ir žalvario amžiaus paminklai, Vol. I, LTSR Mokslų akademijos istorijos institutas, Vilnius, p. 78, depiction No. 360.

[268] The same.

[269] One of the labels in the National Museum of Lithuania says: 'Vilnius 2a spot was in between Vilnius 1 and Vilnius 3 sites, that is to say it was a continuation of Vilnius 1 site'. Whereas 'Vilnius 2b spot was a bit closer to Vilnius 1 site than Vilnius 2a spot was'.

[270] Jablonskytė–Rimantienė, R., 1964, Kai kurie Lietuvos pelolito klausimai / In: Lietuvos TSR Mokslų akademijos darbai, Serie A, Vol. 1 (16), Vilnius, p. 35–37.
Римантене, Р. К., 1971, Палеолит и мезолит Литвы, Вильнюс, p. 30–32.
Šatavičius, E., 2001, Vėlyvojo paleolito kultūros ir jų likimas ankstyvajame mezolite / Doctoral dissertation, Vilnius University, Vilnius, p. 78–81.
Girininkas, A., 2009, Lietuvos archeologija: Akmens amžius, Vilnius, Vol. 1, p. 56.

cores discovered at the site, at least two different flint knapping technologies were distinguished:

1) a non-regular blade and flake production technology used basically by forming double-platform and amorphous cores;
2) a semi-regular blade production technology, for which both unipolar and double-platform cores were formed.

The debitage left behind after the first technology had been applied was predominant. The cores were formed in situ, out of nodules of good quality flint. Presumably, raw material was sourced somewhere in the close surroundings of the site as it was situated in the northern part of the flinty territory.

The flint tool kit contained four points, two of them fragmented (Fig. 106:1–2, 4, 6). Unfortunately, one of these finds was missing, therefore only drawings of it made by R. Rimantienė and E. Šatavičius[271] were analyzed (Fig. 106:2). All four points were formed from the non-regular blades produced from double-platform cores. As it could be seen from the two fully intact points, the tang was formed on the proximal end of the blank with some abrupt retouch from the dorsal side applied to the margins. It was quite narrow compared to the width of the blank. Some retouch was also applied on the tip. Typologically these two points should be ascribed to Ahrensburgian culture and dated to Final Palaeolithic. Another implement which was considered as a tip of a point was also formed on a same type of a blank as the previously depicted ones, also the tip had a few marks of retouch (Fig. 106:4). However, as the presumed part of the tang was broken, it could be only assumedly interpreted as a fragment of another Ahrensburgian point. All three points might be ascribed to the assemblage of one hunter group.

Yet the fourth fragment of a point was of a different type. It was made from a semi-regular blade produced from a double-platform core, but its tip was formed by applying marginal retouch from the ventral side to both theleft and the right edges (Fig. 106:6). The tang part was missing, however, some semi-flat retouch on the left side implicated that it might have been also

[271] Šatavičius, E., 2001, Vėlyvojo paleolito kultūros ir jų likimas ankstyvajame mezolite / Doctoral dissertation, Vilnius University, Vilnius, Fig. 27:4.

formed by retouching the blank from the dorsal side. The ventral side could have been also retouched and then it would be more of a Swiderian type than of Ahrensburgian. Significantly, this artefact was discovered in 'Vilnius 1a' find place, and this feature might be added when explaining why it had differed from the previously described points.

The assemblage of scraping tools stood out as the most numerous. The majority of the scrapers were made from flakes, only some part was formed from semi-regular or non-regular blades produced from one- and double-platform cores. On the basis of the two technologies applied to produce blanks for implement making, it could be presumed that most of the scrapers formed on flakes and non-regular blades could be ascribed to one assemblage together with Ahrensburgian points. The smaller part of scraper collection – tools made from semi-regular or even regular blades (Fig. 107: 8–9, 11–12, 18–19, 21; 108:11–12), could belong to another complex of lithics that would also include the fragmented point discovered in 'Vilnius 1a' find place (Fig. 106:6). To add, one of the scrapers made from a semi-regular blade was also found in the same spot (Fig. 107:11). Of course, some scrapers could be equally related to one or to the other complex.

Burins were formed from various blanks, though most of them were produced from double-platform cores. Some of them were used in one direction, whereas burins with a bidirectional cutting angle formed were also present (Fig. 109). Retouching of the blank edge near the cutting angle was applied in order to protect oneself from cutting the fingers while working.

Vilnius 1 site also yielded several tools of undetermined function, yet relatively little comparing with other sites along the river Neris. Thus, it seems that hunting and hunted prey treatment were the main activities that took place at the sandy terrace of the river, and people did not stay for any longer than it was needed. The non-thorough manner of tool making would make the same impression on the site occupation.

One of the undetermined function artefacts stood out from the rest of the

assemblage and was already taken under discussion decades ago[272] (Fig. 106:3). It was a fragmented flint find formed by regular marginal retouch from the dorsal side along most of its perimeter. The tool was made on a semi-regular blade produced from a unipolar core, both ends were missing. Significantly, a sort of figure was formed by retouching four notches. The figure could be interpreted as anthropomorphous, and was already compared with the blade with notches discovered at Skaruliai 1 site (see section *'Art'*). It was utilized for scraping after it had been broken. This feature could show a double occupation of the site, yet the gap between the two settling stages should have been rather short as the utilization marks were as intensively patinated as the blank.

The lithic assemblage also contained several little blades with some retouch applied to the edges (Fig. 106:7–9). One of them was interpreted as Zonhoven type microlith and ascribed to the Ahrensburgian assemblage by E. Šatavičius[273] (Fig. 106:7). However, this artefact was missing in the collection and could not be reconsidered for this study. Also an axe made from a large flake was discovered. A medial part of this tool was narrowed by retouching two notches on sides (Fig. 106:10). Typologically it could be ascribed to any of the site settling stages.

Around 20% of the tools were made on decortication flakes. Thus, it might be assumed that no special efforts to produce a particularly fitting flake or blade were put in, as soon as there were some usable blanks produced, they were used for tool forming.

It was observed that many flakes were produced and also used as blanks for tool forming. However, the site also yielded a number of unused semi-regular blades and their fragments, which could have been used for implement making instead. As they were not, the chronology of the tool making and blade production could be taken under discussion: presumably some people who had been camping at the site first did not produce semi-regular blades and therefore made their implements from flakes; and later some other visitors who came to

[272] Rimantienė, R., 1984, Akmens amžius Lietuvoje, Vilnius, p. 56.

[273] Šatavičius, E., 2001, Vėlyvojo paleolito kultūros ir jų likimas ankstyvajame mezolite / Doctoral dissertation, Vilnius University, Vilnius, Fig. 27:2.

settle at the same place produced semi-regular blades, made some tools from a part of them, and left some as debitage. Thus, the majority of the tools made from flakes should be ascribed to the assemblage produced by people who used the flake/non-regular blade technology.

To conclude, Vilnius 1 site was most probably visited at least two times in Final Palaeolithic and without a doubt was revisited in a much later period, presumably in Neolithic. These conclusions would correlate with the observation made by E. Šatavičius nearly two decades ago: on the basis of flint patina color he has noted that the assemblage consisted of some earlier and a bit later finds, even when talking about Final Palaeolithic collection[274]. The very first settlers could have been Ahrensburgian group of hunters, who used flake and non-regular blade technology for tool making. Assumedly, their campsite was temporary and was related only to hunting and hunted prey treatment.

After some time, yet also in Final Palaeolithic, some other group of people might have visited the site. These people used semi-regular blade technology and were there also for hunting and some other activity. The flint artefact which could be considered as an anthropomorphous figurine might be related to this stage of site occupation. However, no artefacts would indicate an archaeological culture to which these people could be linked to, yet it could only be presumed that it might have been Ahrensburgian or Swiderian culture.

According to R. Rimantienė, the site might have been occupied by a group of people consisting of 1–3 families (5 to 15 members) including a few hunters[275]. The main purpose for camping might have been reindeer hunt. However, as she has noted herself, a site consisting of several occupied spots was not common to Magdalenian (as she titled it) sites. Moreover, she has also made an observation implicating a rather multiple site settling instead: the spots where lithic artefacts were collected were concentrated within some limits and the finds were not mixed, so the site seemed to had not been occupied for a long time. To sum up, after analyzing the archaeological

[274] Šatavičius, E., 2001, Vėlyvojo paleolito kultūros ir jų likimas ankstyvajame mezolite / Doctoral dissertation, Vilnius University, Vilnius, p. 79.

[275] Rimantienė, R., 1984, Akmens amžius Lietuvoje, Vilnius, p. 52.

information and finds of Vilnius 1 site it could be reconsidered as a place visited for multiple times by some different small groups of people.

Vilnius 2 site

As it was reconstructed on the basis of the Vilnius town maps of 1940, the site could have been on the left bank of the river Neris, on the very edge of the third terrace or its slope, approximately 450 m away from the river flow, around 16–18 m above the river water level. It could have been situated 170–200 m away to the southwest from Vilnius 1 site (Map 37 (P)) and was parted from it by a natural hollow[276]. The site was discovered and visited at the same time as Vilnius 1 site.

An assemblage of flint artefacts was collected from the surface at several spots (according to R. Rimantienė, there were four separate find places)[277]. The lithic collection found at the site was later ascribed to Brommean culture[278]. However, it seems that back then some of the artefacts were missing or mixed[279], thus the actual number of finds from Vilnius 2 site available for analyzing now and then was different. Unfortunately, the most important artefact implicating site relation to Brommean archaeological culture – a point made from a short non-regular blade – was not found in the collection and could only be analyzed on the basis of E. Šatavičius drawing and description made in 2000 (Fig. 110:1). According to the archaeologist, the tang of the point was formed by abrupt retouch applied to the proximal end of the blank from the dorsal side. The bulb was not flaked away, and the tip was left unretouched[280]. On the basis of the technology used for making this tool it would be ascribed to Brommean culture. Thus, most probably some part of the lithic assemblage found at Vilnius 2 site could be related to it.

[276] Rimantienė, R., 1974, Akmens amžiaus paminklai / In: Lietuvos TSR archeologijos atlasas. Akmens ir žalvario amžiaus paminklai, Vol. I, LTSR Mokslų akademijos istorijos institutas, Vilnius, p. 78, depiction No. 360.

[277] The same.

[278] Zaliznyak, L. L., 1999, Tanged point cultures in the western part of Eastern Europe / In: Tanged points cultures in Europe (eds. Kozłowski, S. K., Gurba, J., Zaliznyak, L. L.), Vol. 13, Lublin, p. 202–218.
Butrimas, A., Ostrauskas, T., 1999, Tanged point cultures in Lithuania / In: Tanged points cultures in Europe (eds. Kozłowski, S. K., Gurba, J., Zaliznyak, L. L.), Vol. 13, Lublin, p. 267–271.
Šatavičius, E., 2001, Vėlyvojo paleolito kultūros ir jų likimas ankstyvajame mezolite / Doctoral dissertation, Vilnius University, Vilnius, p. 67–68.
Šatavičius, E., 2004, Bromės (Liungbiu) kultūra Lietuvoje / In: Lietuvos archeologija, Vol. 25, Vilnius, p. 17–44.

[279] Personal consultation with Dr E. Šatavičius, 2018 February 1st .

[280] Šatavičius, E., 2001, Vėlyvojo paleolito kultūros ir jų likimas ankstyvajame mezolite / Doctoral dissertation, Vilnius University, Vilnius, p. 67.

Collection of lithics did not contain many flint implements. There were some scrapers and burins formed from flakes and non-regular blades (Fig. 110). A few burins had retouched edges close to the cutting angle for making the tool convenient to keep in one's hand (Fig. 110:2–3, 5). Also some retouched flakes were recorded.

On the basis of their negatives and several cores discovered at the site two different flint knapping techniques were determined. The first one was a non-regular blade and flake production technology used on double-platform and amorphous cores. It was predominant. Another technique used for flint knapping was flake production using anvil technology. The latter could be more likely related to some site settling stage in Neolithic or Bronze Age.

Even though the cores present at the site implicate that flint knapping activity took place somewhere around, the amount of lithic debitage was very small. It could have been the result of some post-depositional processes, yet more likely the knapping activity zone was somewhere further. Also a presumption could be made that not many tools were needed when the first settlers came to the place, and therefore not much of flint knapping was done. Thus, all the characteristics of the archaeological data discovered in Vilnius 2 site implicate that it was visited for quite a short time and only some activity related to hunting and hunted prey treatment took place in the area. Moreover, half of the implements in Vilnius 2 site were made on decortication flakes. That might also implicate a non-selective quick way of tool making.

Another part of lithic assemblage was quartzite debitage – six flakes possibly produced from the same core. Quartzite nodule surface residues were seen on almost all of the finds. However, as it could be observed on the negatives of the blanks, there must have been more flakes produced, yet most likely they were not found.

***

Comparing to the other sites in the western part of the river Neris basin, Vilnius 1 and 2 sites were situated in a much higher place. The lithic assemblage was also very different in terms of flint knapping technology and tool producing

techniques applied. At this point, where the river Neris turns its flow southwestwards, Vilnius prehistoric sites became the easternmost and also the southernmost archaeological objects taken into consideration for this study.

Žvagakalnis site

Žvagakalnis (a.k.a. Žvalgakalnis) site was one of many sites discovered in the late 30s. Yet, it was not clear if it was found by J. Puzinas, or by K. Jablonskis as both scientists visited the site in 1938[281]. It yielded only a few lithics which were of considerable dating. As it might be reconstructed from the depiction of the site location, it was situated in Žvagakalnis village, on a right bank of the river Neris, around 160–170 m to the north from its flow, on a 9 m high sandy prominence, around 14 m above the river flow[282] (Map 29 (H)). Some other important features of the natural landscape of the site were a small tributary of the river Neris, that was about 140–150 m to the west from the site, and a previously existed lake which was around 200 m to the north.

The only artefact that could indicate the site dating was a scraper made from a non-regular blade, produced from a double-platform core (Fig. 111:7–8). This kind of blade production technology and the formation of scraping edge on the proximal end of the blank would lead to a presumption that the tool could be dated to Final Palaeolithic or Early Mesolithic. However, no further interpretation on the first settling of Žvagakalnis site was possible until a larger scale excavation was undertaken. Whilst a chosen place to settle – the high hill called 'Žvalgų kalnas' (*'Mountain of the sentries'*) – could be interpreted as important for a wide sight in particular, as according to the saying, the overview from the top of the prominence could reach up to 18 km. In prehistory, it could have been an important spot for hunting and communication.

***

Some lithic debitage was also discovered in other places in the Western

[281] Rimantienė, R., 1974, Akmens amžiaus paminklai / In: Lietuvos TSR archeologijos atlasas. Akmens ir žalvario amžiaus paminklai, Vol. I, LTSR Mokslų akademijos istorijos institutas, Vilnius, p. 81, depiction No. 383.
Information on the find labels in Kaunas Vytautas the Great War Museum.

[282] Rimantienė, R., 1974, Akmens amžiaus paminklai / In: Lietuvos TSR archeologijos atlasas. Akmens ir žalvario amžiaus paminklai, Vol. I, LTSR Mokslų akademijos istorijos institutas, Vilnius, p. 81, depiction No. 383.

part of the river Neris basin: in Ardiškis, Aukštieji Rusokai, Bieliūnai, Gudeliškiai, Juozapavas, Karveliškės, Kmitai, Knyzlaukis, Kopūstėliai, Kriokšlys, Krapiliškiai, Kunigiškiai, Kurėnai, Laužiškis, Mickonys, Paberžė, Paparčiai, Paželviai, Savidonys, Smigliai, Šakniai, Tartokas, Verbiškės, Vilkiškės, Visėtiškės, etc[283] (Map 45). However, the lack of typical artefacts does not lead to any presumptions on the dating of these sites except of a conclusion, that these places were also settled at some point in the Stone Age.

7. CAMPING AND LIVING PLACE SELECTION

The archaeological sites dating to Final Palaeolithic–Early Mesolithic in the western part of the river Neris basin were located in places which had some natural features in common, yet at the same time differed. They can be sorted and evaluated in many perspectives. In this work the main emphasis was put on the site location in relation with bodies of water. Also the site function as well as duration of its occupation was analyzed. It has to be noted that the reconstructions of probable types of the settlements were not discerned in terms of a relation to some archaeological cultures, as on the basis of ethnographical data and the multiple settlement pattern recorded in most of the sites it was presumed that the basic criteria for site-catchment formation and establishment of specific spots for some particular activity should have been

[283] K. Jablonskis collection in the National Museum of Lithuania, Vilnius.
Darius Stončius collection of archaeological finds (2010–2012), National Museum of Lithuania, Vilnius.
Collection of archaeological finds from Verbiškės village area in Lithuanian National Museum (various excavations).
Tarasenka, P., 1922, Ieškojimai Neries ir Šventosios santeklyje / In: Mūsų senovė, Vol. 1, book No. 4–5, Kaunas, p. 574–590.
Tarasenka, P., 1928, Lietuvos archeologijos medžiaga, Kaunas.
Jablonskis, K., 1942, Survey diary, Archive of the Lithuanian National Museum, Department of Archaeology, Vilnius.
Rimantienė, R., 1974, Akmens amžiaus paminklai / In: Lietuvos TSR archeologijos atlasas. Akmens ir žalvario amžiaus paminklai, Vol. I, LTSR Mokslų akademijos istorijos institutas, Vilnius.
Respublikinis žemėtvarkos projektavimo institutas, 1988, Lietuvos TSR Jonavos rajono gamtos, istorijos ir kultūros paminklų katalogas, 2nd edition, Centre of Cultural Heritage, Vilnius, file No. 66.
Šatavičius, E., 1996, Vilniaus rajono akmens amžiaus paminklų tyrinėjimai / In: Archeologiniai tyrinėjimai Lietuvoje 1994 ir 1995 metais, Vilnius, p. 26–29.
Zabiela, G., 1996, Kriokšlio pilkapių vietos tyrinėjimai 1994 metais / In: Archeologiniai tyrinėjimai Lietuvoje 1994 ir 1995 metais, Vilnius, p. 89–92.
Brazaitis, Dž., 1998, Žvalgomieji tyrinėjimai Kunigiškių akmens amžiaus gyvenvietėse / In: Archeologiniai tyrinėjimai Lietuvoje 1996 ir 1997 metais, Vilnius, p. 4–7.
Girininkas, A., 1998, Nauji archeologijos paminklai Kaišiadorių rajone / In: Archeologiniai tyrinėjimai Lietuvoje 1996 ir 1997 metais, Vilnius, p. 451.
Šatavičius, E., 2006, Archeologiniai žvalgymai ir žvalgomieji tyrimai Pietų ir Rytų Lietuvoje / In: Archeologiniai tyrinėjimai Lietuvoje 2005 metais, Vilnius, p. 284–400.
Kurilienė, A., 2009, Kaišiadorių rajono archeologijos sąvadas, Vilnius.
Šatavičius, E., 2011, Akmens amžiaus gyvenviečių paieška ir tyrimai Pietų bei Rytų Lietuvoje / In: Archeologiniai tyrinėjimai Lietuvoje 2010 metais, Vilnius, p. 18–25.
Šatavičius, E., 2013, Naujos akmens amžiaus gyvenvietės Pietų ir Rytų Lietuvoje / In: Archeologiniai tyrinėjimai Lietuvoje 2012 m., Vilnius, p. 34–39.
Bitner-Wróblewska, A., Banytė-Rowell, R. (eds.), 2016, Inwentarz archeologiczny guberni kowieńskiej Michała Eustachego Brensztejna, Aestiorum Hereditas III, Part 1, Warszawa, p. 351.

more or less the same, taking Swiderian, Ahrensburgian or other culture. Thus, the main attention was given to the geographic features of the landscape that surrounded people in the period of concern, having in mind that a more and more dense vegetation was covering the area as the time passed.

At least three types of selected places for living could be distinguished if the big rivers Neris and Šventoji, their tributaries and lakes (present as well as previously existed) were taken into account as natural features which were the most important attraction points for the first inhabitants: 1) sites situated close to the small tributaries; 2) sites established on a wide sandy bank of a big river; 3) sites situated near the previously existed lakes. All three types of sites could be interpreted as related to some particular activities and functions. However, the simulated distinction is based on presumptions, and as there are many ways to interpret the size and function of prehistoric settlements[284], I do agree that each site could be regarded in other ways, depending on the data which is taken into consideration.

7.1 Sites situated near tributaries

Many Final Palaeolithic and Early Mesolithic sites discovered in the river Neris basin were situated on the banks of small tributaries (e.g. Pabartoniai 1, Pugainiai, Samantonys, Mitkiškės, etc.). Therefore, in comparison with the sites located a few hundred metres away from the small rivers, those sites could be seen as particularly chosen for occupation because of the benefits that the tributaries provided. The small stream of fresh water could have been convenient for fishing and food preparation. However, flint tools found at those sites implicated that the most important activities were hunting and hunted prey treatment. Moreover, in most cases they seemed to have been occupied only temporarily. Thus, it seemed most likely that some campsites next to the small tributaries would not have been planned beforehand, but were occupied simultaneously: for example, just after the hunt, close to the final

[284] Grøn, O., Kuznetsov, O. V., 2004, What is a Hunter-Gatherers Settlement? An Ethno-archaeological and interdisciplinary approach / In: Le Mesolithique / The Mesolithic, Section 7.1: Landscape-Use During the Final-Palaeolithic and Mesolithic in NW-Europe: The Formation of Extensive Sites and Site-Complexes, BAR International Series, book 1302, p. 47–53.

spot of hunting process, especially if the hunted animal was large (e.g. moose) and needed to be treated at once. According to L. L. Zaliznyak, people might have stayed in these kinds of camps until the hunted meat was consumed[285]. Whereas the water stream might have benefited for all the activities related to prey treatment.

Some remains of fireplaces in these sites could be interpreted in various ways, and the food preparation would be only one of the optional functions. According to the ethnographic data, the temporary fireplaces were made for heating the area before going to sleep, also some smokers were built to get rid of the mosquitos[286]. These kinds of archaeological objects found at the sites in the river Neris basin could be recorded as simple stains that stand out from the surrounding sediment by their color and hardness.

Some archaeological features in these kinds of sites were hard to define and interpret, e.g. the stains (pits) which contained knapped (or fractured) sandstones in Pabartoniai 1 site. Unfortunately, it has to be admitted that other activities than hunting, prey treatment, flint knapping and fire making would be difficult to trace using ordinary archaeological methods of investigation, especially from Final Palaeolithic. It could only be presumed that some hunting sites near the small creeks where traps could have been regularly set, were very common in the period in question, yet almost impossible to trace.

7.2 Sites on a bank of a big river

Some sites, majority of which could be dated to Final Palaeolithic on the basis of lithic typology, were situated on a bank of a big river, on a sandy terrace. The small tributaries were situated somewhere in a distance of a few hundred metres, therefore presumably they did not play a big role when the place for settling was chosen. These sites were in a rather long distance from the big river too, sometimes it even reached 700–1000 metres. Yet it seemed most likely that two main criteria when selecting the place for camping in such a site were important: a wide overview in the first place, and a convenient

[285] Zaliznyak, L., 1997, Mesolithic Forest Hunters in Ukrainian Polessye, BAR International Series, book 659, England, p. 64.

[286] Taiga Nomads: Hundreds of Homes (Part 1), 1992, Documentary film series, Great Britain.

access to the big river shoreline in the second. Whereas the archaeological finds clearly showed that the main purpose for settling in those sites was hunting. In addition, the distribution of occupied spots was diffusive, thus it seems that in most cases they were visited for multiple times by some different people, yet having the same intention. All these characteristics had led to an impression, that these sites functioned as seasonal hunt spots, most likely related to chasing the migrating animals, e.g. reindeer, which were usually being slaughtered when crossing a river (a hunting strategy used by Eskimo, Nenets and other peoples[287]). These sites could have been visited for many times, yet every time they were occupied for a short period of time. Some groups of prehistoric hunters might have gathered for the same purpose, and in this case the site could have become a place of interaction and communication as well. The site location could havedepended on the direction of the seasonal animal migration: northern–northeastern banks should have been occupied in spring (e. g. Drąseikiai, Saleninkai case), whereas south–southwestern banks – in autumn (e. g. Skaruliai 1 case). According to the ethnographic data of Nunamiut tribes, these animals usually took the same paths when going both directions[288]. Thus, some similar type of sites might have been established on the opposite bank somewhere in the close vicinity (e.g. Saleninkai site in relation to Skaruliai 1 site).

Settling on a first or second terrace allowed hunters to overview up to 6–7 km of the river Neris valley. In the case of Bartoniai site, it could have been even 8–9 km. Strategically, it was useful for noticing the appearance of hunted animals rather early and to have enough time to prepare for attack. However, some of the sites situated on the big river banks were not sheltered by the higher (e.g. third) terrace, and should have been easily visible from a long distance too. On one hand, occupying such an open place could have been an appropriate decision if other groups of people were about to be met, or if a

[287] Gubser, N., 1965, Nunamiut Eskimos. Hunters of Caribou, London, New Haven, 384 p.
Grøn, O., 2005, A Siberian perspective on the north European Hamburgian Culture: a study in applied hunter-gatherer ethnoarchaeology / In: Before Farming, Vol. 1, p. 35–64.

[288] Binford, L. H., 1991, A Corporate Caribou Hunt. Documenting the Archaeology of Past Lifeways / In: Expedition: The magazine of the University of Pennsylvania, Vol. 33, p. 33–43.

general purpose was to be visible (whether for amicable or defensive reasons). On the other hand, a burning fire light at the site and the smell of smoke could scare away most of the cautious animals. Maybe that was the reason why the camps were established further from the river flow. Yet that kind of place should have been quite windy and unpleasant to stay for longer period of time, especially in the cool season of the year. Thus, presumably a place with some vegetation that could surround and shelter the site at least from one side might have been chosen.

As it was recorded in the ethnographic data[289], the hunters' campsites on the bank of a big river should have also been positioned in a right place in the ratio with probable spots on the other bank where migrating animals were supposed to be approaching the river. The small tributaries should then have played an important role, as the herds of animals might have used it as a convenient path heading to their destination: the relief at the lower reaches of a small river was usually sloping, and the water stream was important for a thirsty herd of animals. Thus, a tributary on the opposite side of the river would have been an important natural feature that had to be kept in mind when selecting the place for campsite (e.g. situation of Skaruliai 1 or Drąseikiai site). However, the migrating animals usually crossed the river in a diagonal angle due to the stream flow. The river Neris runs in 2–6 km/h speed[290], yet when it was a bit wider, it could have ran faster. Whilst reindeers (as well as most of other ungulate animals) can swim up to 10 km/h, thus, the distance between the points where an animal entered the river and reached the opposite side could have been a few hundred metres or even a kilometre. Therefore, the campsite must have been situated further downstream (e.g. Skaruliai 1, Saleninkai, Kernavė 3, Liaukiškiai, and some other sites). In this way the animals would have been also not able to see and avoid the hunters who were chasing them. According to the ethnograpchic data of Nunamiut tribes, many additional sites

[289] Walls, M., 2009, Caribou Inuit Traders of the Kivalliq Nunavut, Canada, BAR International Series, book 1895, Oxford, 73 p.
[290] Neris. Tarybų Lietuvos enciklopedija, 1987, Vol. 3, p. 205–207.

for observation were established for spotting the approaching animals[291]. They could have been either seen or be heard if the wind was blowing from the opposite side, as the herd usually makes grunting sounds.

To sum up, the campsites of hunters were most likely established in the thoroughly selected places, on the basis of many different factors. Thus, even if there were wide and long free areas on the terraces of the river, the same particular places were revisited for several times. It could be also presumed that one group of Final Palaeolithic people could have had several spots for settling on both sides of the river: one for autumn hunt, and the other one – for camping in spring, not taking into account the other places where they could have probably lived for longer periods of time during other seasons of the year. However, even if there were sites situated close to each other (Kernavė 3 and Mitkiškės; Bartoniai and Pabartoniai 1, etc.), they should probably not be paired and related as belonging to one group of hunters. Instead, some two very different spots could have been chosen, situated a few dozen kilometres away or even more. The relation between them could only be reservedly detected after comparing the lithic assemblages (e.g. some similarities in flint tool production techniques could be seen between Kernavė 3 and Saleninkai 2 sites, as well as among Eiguliai, Skaruliai 1 and Drąseikiai sites).

However, some sites situated near the big rivers were different and could not be ascribed to a 'temporary hunting place' type. Perhaps not by coincidence these sites were discovered only after a larger or smaller scale excavation was undertaken. Probably they were not located earlier, because the flint finds were not exposed on the surface in the last few hundreds of years. Therefore these sites should most probably be more numerous in the territory of concern, yet for the moment there were only two cases when they were found and investigated: Neravai and Skaruliai 2 site. They are extremely important for the reconstruction of the first settling of the river Neris basin, because they have yielded some prehistoric huts – archaeological features

[291] Binford, L. H., 1991, A Corporate Caribou Hunt. Documenting the Archaeology of Past Lifeways / In: Expedition: The magazine of the University of Pennsylvania, Vol. 33, p. 33–43.

implicating a long-term stay settlements of Final Palaeolithic Swiderian groups of people.

After analyzing the archaeological data obtained from the excavations in Neravai and Skaruliai 1 sites, it could be concluded that the long-term sites on the big river banks have several characteristics in common:

1) they were situated few hundred metres away from a tributary;
2) the distance to a big river was 500–600 m long;
3) some 'temporary hunting places' were a few kilometres away from the site;
4) the sites yielded remains of a prehistoric hut of a recessed type with some stones used for construction;
5) the flint assemblage contained not a high number of points;
6) more than one flint knapping concentration could be determined within the limits of the site.

These sites should be seen as the ones that were occupied by a small group of people, presumably consisting of one or a few families. The efforts put into the hut constructing show that the site settling was planned beforehand, thus, the place for settling was most probably carefully selected. The hut in Neravai site was built by utilizing a local stone – an erratic boulder that might have been moved (though if it was, then probably from a close vicinity). A similar use of two large boulders for hut construction was recorded in Årup site in Sweden[292] dating to Final Palaeolithic–Early Mesolithic, that was interpreted as a hunting station, occupied for several days. Thus, most likely the boulders were natural features that attracted people to occupy a particular place and were seen as 'convenient details' of the dwelling structure. That could have been also the case in Neravai site. In general, the use of stone boulders might be regarded as a feature that could have been very characteristic to a prehistoric settlement, as well as completely a not common feature. According to some ethnographic and archaeological data of Palaeo-Eskimos, a wide range of dwellings were in use

[292] Karsten, P., Nilsson, B. (eds.), 2006, In the Wake of a Woman: Stone Age pioneering of North-Eastern Scania, Sweden, 10.000–5000 BC, The Årup settlements, Lund, p. 90–91, Fig. 60–62.

even within the groups of people of the same culture who lived in the similar landscape[293]. Thus, the use of only some boulders for the hut construction (instead of forming a ring of boulders, or not using any stones at all) could be a feature that relates the settlements investigated in Neravai and Skaruliai 2, yet might also be not significant for the interpretation of the similarity of these two sites.

However, even though the amount of efforts in establishing the settlement in Neravai implicate a rather long period of its occupation, some other features might still give a hint that the site should have been abandoned after a short time. As O. Kuznetsov has noticed, the sites where the waste dumps or latrines are situated close to the dwelling, must have been settled for a short term, as on the opposite, these kind of objects should then be installed in a greater distance[294]. That could be the case of Neravai site, if the presumed latrine and the prehistoric hut, situated quite close to each other, would be proved to be of the same chronology. In addition, if compared with a Swiderian dwelling discovered in Malaya Osnitsa (Ukraine)[295], the Neravai and Skaruliai 2 huts are lacking some features that could implicate a longer stay at the place: spots of ash or other stains – remains of inset stuctures.

The reasons for a long-term stay for a group of people that is usually regarded as preferring a nomadic way of life could be various. One of them might be related to a particular period when the mobility of the human group was limited. An assumption could be made that it might have been an illness of one/several members of the family, a last trimester of pregnancy or some occasion when part of the group had to leave for some reason while others had to wait for them. There are cases recorded in the ethnographic data from aboriginal tribes (e.g. Itenm'i people) when old people or young children stay

[293] Couchaux, D., 1980, Habitats nomades, Paris, 160 p.
Jensen, J. F., 1993, Intrasite Analysis of Palaeo-Eskimo Campsites / Master thesis, University of Copenhagen.
Kuznetsov, O. V., 2010, Ethnoarchaeology in Siberia: an implication to Late Palaeolithic Settlements analysis / In: Treballs d'Etnoarcqueologia, No. 6: Etnoarqueología de la Prehistoria: más allá de la analogía, p. 173–188.

[294] Kuznetsov, O. V., 2010, Ethnoarchaeology in Siberia: an implication to Late Palaeolithic Settlements analysis / In: Treballs d'Etnoarcqueologia, No. 6: Etnoarqueología de la Prehistoria: más allá de la analogía, p. 173–188.

[295] Telegin, D., Okhrimenko, G., 1999, A Dwelling of the Swiderian Culture from Malaya Osnitsa in Volhynia (Ukraine) / In: Tanged points cultures in Europe (eds. Kozłowski, S. K., Gurba, J., Zaliznyak, L. L.), Vol. 13, Lublin, p. 292–296.

in one settlement for a long period, even throughout the year[296]. Another presumption would be that these sites were occupied in wintertime, when temporary campsites could have been difficult to be built frequently. This kind of regular settling at one place for a bit longer period was recorded as common to the most of indigenous people that were investigated by ethnographers[297]. However, according to the Evenki people (Siberia), the building of a campsite and packing things for moving forwards is much easier in winter time than in summer, as then the slides can be used and there are no mosquitos[298]. A recessed type of huts could also indicate the site use in cold weather, as the dwellings built in warm season would barely leave archaeological traces[299]. In addition, the distance between the living place and the body of water could be taken into consideration as well: it is obscure why the occupied place was so far from the source of water, having in mind that it was indispensable for food preparation and other activities. In a hypothetic level it could be assumed that if the place was inhabited in winter, melted snow could have been used instead, and then there could have been no need to access a small river, as it was recorded to be usual for some indigenous people[300]. The reason why a distant place was selected could also be the perception that a small river was a hunting and fishing area, which should not be settled.

On the contrary to the long-term settlements, the temporary hunting camps, visited in autumn and spring, most probably were simpler. As it could be reconstructed on the basis of Alaskan Kutchin people habitude, no huts for sleeping might have been built, and the only material feature of a campsite that was left, might have been a fireplace[301]. Therefore despite the criteria for campsite selection numbered earlier in this chapter, also a few important points

[296] Lee, R. B., Daly, R. (eds.), 2012, The Cambridge Encyclopedia of Hunters and Gatherers, p. 149.

[297] Zaliznyak, L., 1997, Mesolithic Forest Hunters in Ukrainian Polessye, BAR International Series, book 659, England, p. 82.

[298] Taiga Nomads: Hundreds of Homes (Part 1), 1992, Documentary film series, Great Britain.

[299] Zhilin, M. G., 2004, The use of living space at Mesolithic sites in Central Russia / In: The Use of Living Space in Prehistory (ed. Smyntyna, O. V.), Papers from a session held at the European Association of Archaeologists Sixth Annual Meeting in Lisbon 2000, BAR International Series, book 1224, p. 79–89.

[300] Grøn, O., Klokkernes, T., Turov, M. G., 2009, Cultural small-scale variations in a hunter-gatherer society: or 'everybody wants to be a little bit different!' An ethnoarchaeological study from Siberia / In: Mesolithic Horizons. Papers Presented at the Seventh International Conference on the Mesolithic in Europe, Belfast 2005 (*eds.* McCartan, S. B., Schulting, R., Warren, G., Woodman, P.), Vol. 1, p. 205.

[301] Nelson, R. K., 1973, Hunters of the northern forest, Designs for survival among the alaskan Kutchin, The University of Chicago Press, 320 p.

could be mentioned: a flat surface for camping, and an access to fuel sources (wood). According to some ethnographic data of Evenki and Nunamiut people, the latter might be even more important than some food resources[302].

7.3 Sites near previously existed lakes

Some sites in the western part of the river Neris basin were situated close to previously existed lakes, which are barely seen in the present landscape. Significantly, these places are related to the lakes leaked by small rivers, which flow into the big rivers (e.g. Dūkšteliai, Aliejūnai, Draučiai sites). Contrary to the sites situated on the banks of the rivers, the lake-related sites yielded very few artefacts of the earliest stage of settling, and were later re-occupied in Mesolithic and Neolithic–Bronze Age or even later. In Dūkšteliai case, an Early Mesolithic hearth used for a long time was unearthed. This feature implicated that the site was not temporary, yet having that in mind, flint artefacts were then lacking. Presumably, this situation could be explained by the influence of the later settling stages and exploitation of flint debitage in later times. Whereas the sites on the banks of the lakes were most probably the ones where people could have spent more time in Early Mesolithic or even in Final Palaeolithic. The small rivers leading to the big river could have served as 'paths' to the hunting areas where temporary campsites were established.

The dating of the earliest settling of the banks of the lakes could reach Younger Dryas or even earlier periods, as the Late Glacial environment was already suitable for humans to establish short- or long-term campsites. People of Swiderian culture was known to have been settling shores of the lakes[303], therefore it might be presumed that some areas around previously existed lakes

[302] Jochim, M. A., 1976, Hunter–Gatherer Subsistence and Settlement. A Predictive Model, New York, San Francisco, London, p. 49.
Grøn, O., Kuznetsov, O. V., 2004, What is a Hunter-Gatherers Settlement? An Ethno-archaeological and interdisciplinary approach / In: Le Mesolithique / The Mesolithic, Section 7.1: Landscape-Use During the Final-Palaeolithic and Mesolithic in NW-Europe: The Formation of Extensive Sites and Site-Complexes, BAR International Series, book 1302, p. 47–53.
Henry, A., Théry-Parisot, I, Voronkova, E., 2009, La gestion du bois de feu en forêt boréale: archéo-anthracologie et ethnographie (region de l'Amour, Sibérie) / In: Gestion des combustibles au paléolithique et au mésolithique. Nouveaux outils, nouvelles interpretations (eds. Théry-Parisot, I., Costamagno, S., Henry, A.), BAR International Series, book 1914, Proceedings of the XV World Congress (Lisbon, 4-9 September 2006), p. 17–37.

[303] Sobkowiak-Tabaka, I., Kubiak-Martens, L., Okuniewska-Nowaczyk, I., Ratajczak-Szczerba, M., Kurzawska, A., Kufel-Diakowska, B., 2018, Reconstruction of the Late Glacial and Early Holocene landscape and human presence in Lubrza, Western Poland, on the basis of multidisciplinary analyses / In: Environmental Archaeology, Vol. 23:2, p. 123–136.
Ralska-Jasiewiczowa, M., Goslar, T., Madeyska, T., Starkel, L. (eds.), 1998, Lake Gościąż, Central Poland. A Monographic Study, Part 1, 340 p.

in the western part of the river Neris could be the same early or pre-date Dūkšteliai 1 site (8827–8750 cal BC).

7.4 Site placement near particular landscape features

There were some cases when sites in the river Neris basin were situated in the landscape with particular features. Several spots in the river Neris watercourse were significant because of a regular tendency of island formation. Saliai site was situated on the river bank just at the point where the islands had been forming and re-forming for thousands of years respectively. Not to mention the fact that the toponym and a hydronym of a tributary (situated nearby) 'Saliai' means a 'place of islands'. The same linguistic interpretation could be applied to Saleninkai site as the beginning of the toponym 'Sal-' could also implicate a relation with islands ('Sala' in Lithuanian), which are also common in that part of the river Neris. Thus, presumably this place could have been selected for occupation not accidentally, but having in mind the benefits of the islands. Those were mostly related to some good places for fishing: some particular areas around the islands are known as preferable places where fish position themselves[304]. These benefits could have been useful for prehistoric people who had settled Kernavė, Mitkiškės, Semeniškiai sites, as well as Padaliai and Liaukiškiai sites. Yet as one side of the island is where a deep dip usually forms[305], those places were not the most convenient to cross the river, neither for humans, nor for animals.

Another important natural feature of the river is residual boulders of stone or even concentrations of them. Unfortunately, the rivers were cleaned up for many times in the recent few hundred years due to sailing purposes (many of them were blown out in the interwar period in the 20th century), therefore not many stones were left in their original places. It would be hard to interpret if these kind of natural features were helpful when crossing the river or fishing. Instead, they could have served as natural landscape marks, and could have

[304] Zanevičius, K., 2004, Megėjiška žūklė. Teorija ir praktika, p. 44.

[305] Personal consultation with Prof. P. Šinkūnas, 2018.

been important to prehistoric people for orienting. One of this type of boulders (besides, the biggest recorded in Lithuanian rivers) is located in the river Neris at the point where Drąseikiai site was situated.

Another site presumably related to a geotopic erratic stone was Dvaronys site, situated somewhere close to the biggest on-land boulder recorded in Lithuanian territory. The stone is located on the left bank of the river Šventoji. Nowadays the area is partly covered by forest. However, in Late Pleistocene or Early Holocene it could have been a quite open sandy place, and the boulder could have been visible, probably even more than it is today. A landscape mark of a size like this (approximately 7,5 m in diameter) could not have been left unnoticed, thus, it might have been considered as one of the reasons for camping in Dvaronys site. The boulder might have marked a distance to the big river Neris, which was approximately 85–90 km, or several days of walking on foot along the river valley. Some more large residual boulders were recorded to have been close to Saleninkai and Mitkiškiai villages on the river Neris bank, also at some places in the river Šventoji valley[306].

It could be assumed that other places where some of the described natural features emerge in the valleys of the big rivers could be potential for discovering some still unknown prehistoric sites (e.g. near Mykoliškiai and Salupiai villages, where a big boulder lies in the river Neris bed and where a tendency of island formation exists).

Several sites stood out as being located relatively high: Žvagakalnis site was approximately 15 m above the river water level, while Vilnius 1 site was even 16–18 m higher than the river flow. These two cases could be interpreted as sites particularly selected for lookout, which, in Žvagakalnis site case, might have been a dozen kilometres wide. However, the dating of this site is not verified. Hunters at Vilnius 1 site were most probably observing the wide first terrace of the opposite site of the river Neris, several kilometres to the north–northwest, as it could have been a potential place for a reindeer herd to approach the river and cross it.

[306] Tarasenka, P., 1922, Ieškojimai Neries ir Šventosios santeklyje / In: Mūsų senovė, Vol. 1, book No. 4–5, Kaunas, p. 588.

Some opinions exist, that the campsites by the big rivers should not be regarded as hunting sites, but seen as fishing sites instead[307]. Whilst the sites established near smaller tributaries, according to L. L. Zaliznyak, would then be rather interpreted as hunting spots. However, the analysis of hunting tool assemblages found in both types of sites has shown that probably it was not the case in the river Neris basin. Yet the conception of a 'big river' might differ and the river Neris as well as Šventoji could be relatively ascribed to the small river category.

Another way of analyzing the selection of the place for settling could be the correlation between the distribution of shoals and rapids in the river bed and the placing of the known archaeological sites. Rapids were very common in the river Neris, yet not so characteristic for the river Šventoji. In the territory of concern there were dozens of these hydrological features, some of them located very close to the prehistoric sites. It is difficult to determine if these natural features were at the same place in Early Holocene as it is today, but they definitely existed. Rapids were very dangerous due to strong water stream and large slippery stones under it. Thus, it would be reasonable to think that reindeers would have rather crossed the river at some sandy or gravely shoals. Unfortunately, the exact location of the latter could not be determined as the Alluvial deposit places in the river were constantly changing. The opportunity to cross the body of water was also important for prehistoric people, as the campsite for hunting must have been situated on a certain bank of the river if migrating animals were chased. Assumedly, in this case hunters had also used the shoals, and some rapids were avoided instead of chosen for getting to the other side of the river. In winter the big river might have been crossed easier if frozen. In present times the river Neris can freeze for up to several months per year, yet in Preboreal it might have been covered by ice for longer.

Camping on the river Neris banks had also depended on the season of the year. Typically, the river flood occurs in spring, starting in March and ending in May. By this time the river water level can raise by 3–4 m in the territory of

[307] Zaliznyak, L., 1997, Mesolithic Forest Hunters in Ukrainian Polessye, BAR International Series, book 659, England, p. 77.

concern. The summer flood happens to be less significant, as the water level ascends by 1–2 m. Thus, in spring time it could have been quite difficult to cross the river.

According to R. Rimantienė, some of the Stone Age sites in the lower reaches of the river Neris were situated on higher terraces due to transgressions that were known to have happened in Holocene. On the basis of this theory she proposed dating the sites to Atlantic or Subboreal period[308]. However, the Final Palaeolithic and Early Mesolithic lithic assemblages found at the sites situated on the first river terrace proved that the river Neris valley was not significantly affected by these hydrological events. Presumably, because it was rather far from the Baltic Sea and it was a relatively small body of water itself. Thus, the camping place selection more likely depended on previously described natural and strategic criteria. In addition, the main purpose for a new site establishment was always accompanied by at least several sub-purposes, e.g. if the main aim was a reindeer hunt, then people had to foresee other options of food supply if the hunt was not successful enough or if it took much more time than it was presumed.

8. SITE-CATCHMENT AND ECONOMY OF THE FIRST INHABITANTS

The reconstruction of the usual life of the pioneers of the land which was taken into discussion for this study was not simple. First of all, the archaeological material obtained during the surface surveys was not telling a lot, and second – the majority of sites investigated were temporary campsites and were re-occupied later for multiple times. Therefore only 'momentary archaeology' was possible, whilst the long-term processes were difficult to determine. However, some insights may still be given on the ways prehistoric people obtained raw material for their tool production, also an interpretative picture of the first inhabitants' mobility and site-catchment could be drawn. Some characteristics were most likely naturally determined by the location of

[308] Rimantienė, R., 1984, Akmens amžius Lietuvoje, Vilnius, p. 192.

the western part of the river Neris basin itself. Whereas the relation with neighboring territories that had some particular features (e.g. more flint resources) also played a role in the subsistence of the first settlers of the land.

8.1 Raw material sourcing

One of the main questions that was raised in the begining of this study, was how did the pioneers of the western part of the river Neris basin dealt with flint sourcing and what were the raw material routes to the territory of concern. After the lithic assemblages of various prehistoric sites were analyzed, it became apparent that the very first inhabitants had access to some sources of good or very good quality material. In some areas in the river Neris valley some palaeontological remains of *Belemnoidea* species were found. These animals relate to Cretaceous period and, possibly, to the flint rock formation. Thus, some nodules of it could maybe be found in the area and used. However, the surrounding territories that were surveyed (some parts of the river Neris valley and Dūkšteliai lake microregion) yielded only rather small pieces of local material. It was of low quality and was not suitable for long blade production technology due to many chalk inclusions and cracks. As it could be seen from the archaeological data, this kind of flint was not selected and used by the pioneers of the land. One case recorded in Pabartoniai 1 site could prove this assumption, as there was a pebble of poor quality local flint found in the lowest layers of the site. Some negatives of trial striking visible on this specimen have shown that people had actually tried to use it for knapping (probably due to the lack of material), yet soon saw that it was not suitable.

The closest area where flint nodules can be found lying on the ground surface is in the southern part of modern Lithuanian territory, a few dozen kilometres away from the river Neris flow, whilst also some areas to the west are rich in flint (Map 44). At least three places in the southern area were considered as flint exploitation sites (Ežerynai, Margionys, Titnas) and investigated, whilst some lately discovered sites in Būdos village and near Glynas Lake were not yet

excavated[309]. The nearest of these places – Ežerynai site – was situated around 70–75 km straight away from the river Neris and could have been reached by going along the river Neman valley in one week if going on foot, thus, it was relatively far. However, the place was lately reconsidered and interpreted as a flint working site rather than an exploitation place[310]. The other four places yielding flint material of high quality might be considered as optional places from which the material could have been transported to the river Neris basin and even further to the north. On contrary, some areas in the flinty territory were very close, two of them in particular: an area to the south from the intersection of the Neris and Neman rivers, and an area to the south from the present Vilnius town. Presumably, these two territories could have played an important role in the flint material exploitation and should have been explored by the first settlers of the western part of the river Neris basin.

After analyzing the flint debitage from various sites in the western part of the river Neris, it was noticed that the sites situated in the northern part of the area of concern yielded only flint cores that were completely used. Whereas contrarily the sites which were closer to the flinty area in the south were abandoned after leaving some big pieces of flint – cores that could have been still used after some correction strikes done.

The ways of flint material transportation in Lithuania have been discussed in archaeological literature for many times[311]. Two basic options were usually taken into consideration: exchange system and direct exploitation. Both of them were related to some prehistoric human communities that were 'in charge' of the flint mining sites[312]. The exchange system could have been based on the interaction between some groups of people. In case of the river Neris basin, this

[309] Jablonskytė-Rimantienė, R., 1966, Paleolitinės titnago dirbtuvės Ežerynų kaime (Alytaus rajonas, Raitininkų apyl.) / In: Lietuvos TSR Mokslų akademijos darbai, Serie A, Vol. 2 (21), Vilnius, p. 87–100.
Ostrauskas, T., 2000, Tyrinėjimai Margionių titnago kasyklų ir dirbtuvių komplekse 1999 m. / In: Archeologiniai tyrinėjimai Lietuvoje 1998 ir 1999 metais, Vilnius, p. 50–51.
Šatavičius, E., 2012, Titnago kasimo ir apdirbimo dirbtuvės prie Titno ežero / In: Archaeologia Lituana, Vol. 13, Vilnius, p. 66–83.

[310] Šatavičius, E., 2012, Titnago kasimo ir apdirbimo dirbtuvės prie Titno ežero / In: Archaeologia Lituana, Vol. 13, Vilnius, p. 66.

[311] Rimantienė, R., 1984, Akmens amžius Lietuvoje, Vilnius, p. 42–47.
Baltrūnas, V., Karmaza, B., Kulbickas, D., Ostrauskas, T., 2007, Egzotinė titnago bei titnago pakaitalų žaliava Lietuvos akmens ir žalvario amžiaus gyvenvietėse / In: Lietuvos archeologija, Vol. 31, Vilnius, p. 109–122.
Girininkas, A., 2009, Lietuvos archeologija: Akmens amžius, Vol. 1, Vilnius, p. 62–63.

[312] Šatavičius, E., 2012, Titnago kasimo ir apdirbimo dirbtuvės prie Titno ežero / In: Archaeologia Lituana, Vol. 13, Vilnius, p. 66.

system could have been quite simple and might have consisted of only a few people interacting, as presumably there were only several site- catchment areas intersecting within the limits of a territory of approximately 13 000–14 000 km^2. According to the ethnographic data of a range of aboriginal tribes, the item exchange spots were visited once or twice a year[313]. The routes of flint material transportation could be drawn in several ways:

1) from the south along the river Neman, distributing flint at some point close to the river Neris (could be a place in the lower reaches of the river Neris, e.g. at Eiguliai 1 site);
2) from the south along the river Vokė valley, spreading the 'items' somewhere close to the river Neris (could be at some sites in the valley of the river Vokė, e.g. near Papiškės or Dvaras village, where a rich lithic assemblage was recorded[314]) to two directions along the river Neris valley: upstream to the northeast and downstream to the west–northwest;
3) along the valleys of the smaller rivers leading to the river Neris basin (tributaries on the left bank of the river).

A similar direction of flint exchange was drawn by T. Ostrauskas when the Kunda culture supply of raw material was taken into cosideration[315]. It could be reasonable to think that the routes did not change a lot from Younger Dryas to Preboreal period. As the flint material in Estonian Early Mesolithic was most probably transported from Lithuanian exploitation centres[316], the river Neris basin should have been passed through when the items were carried northwards. Some of them might have been exchanged and utilized in the territory of concern. Thus, it could be presumed that maybe some nodules of better quality were selected here and did not reach northern lands.

[313] Zaliznyak, L., 1997, Mesolithic Forest Hunters in Ukrainian Polessye, BAR International Series, book 659, England, p. 82.

[314] Brazaitis, Dž., 2004, Papiškių 4-oji durpyninė gyvenvietė / In: Lietuvos archeologija, Vol. 25, Vilnius, p. 187–220.
Brazaitis, Dž., 1999, Dvaro kaimo (Vilniaus r.) akmens amžiaus radimvietės / In: Lietuvos archeologija, Vol. 16, Vilnius, p. 281–309.

[315] Baltrūnas, V., Karmaza, B., Kulbickas, D., Ostrauskas, T., 2007, Egzotinė titnago bei titnago pakaitalų žaliava Lietuvos akmens ir žalvario amžiaus gyvenvietėse / In: Lietuvos archeologija, Vol. 31, Vilnius, p. 109–122.

[316] Kriiska, A., Lõugas, L., 2009, Stone Age settlement sites on an environmentally sensitive coastal area along the lower reaches of the River Pärnu (south-western Estonia), as indicators of changing settlement patterns, technologies and economies / In: Mesolithic Horizons. Papers Presented at the Seventh International Conference on the Mesolithic in Europe, Belfast 2005 (*eds.* McCartan, S. B., Schulting, R., Warren, G., Woodman, P.), Vol. 1, p. 171.

The equipment used for transportation of flint material should also be discussed although no archaeological finds were discovered that could implicate a use of some sort of devices. It could only be presumed that during the snowy season some equipment similar to sledges or skiis could have been used in Final Palaeolithic and Early Mesolithic, though not particularly of the forms that are in use in present times. Of course, some raw material might have been carried packed on one's back, yet some sliding device should have been convenient when it came to carrying big amounts of nodules. Some archaeologists believe that some kind of boats could have been already used in Final Palaeolithic–Early Mesolithic[317]. That could have also been a way to transport the flint items when the rivers were not frozen, as most of them in the northern part of the flint area are flowing to the river Neris basin direction (to the northwest–north–northeast).

The majority of sites have yielded a lithic assemblage of good quality flint, implicating that the flint nodules (prepared cores were rather an exception) were brought to the campsites. However, the quantity of this material has varied, – it was apparent from the number of decortication flakes present in the collections. In some cases many of them were used for tool making (Drąseikiai, Kernavė 3, Saleninkai 2, Skaruliai 2) (Table 9). This specific character of flint use was especially applied for scraper production and was also noticed in other sites of similar dating beyond the limits of Lithuanian territory (e.g. Lubotin 3 site in Ukraine[318]). This feature could be explained at least in two ways: either those implements were made quickly without bothering to prepare a nicier blank; or the flint material was lacking and those tools (scrapers in particular) were the very last ones that were needed to be used, and therefore they were made from the blanks that were left – decortication flakes. The latter interpretation could also be related to the situation of flint exploiting. On one hand, it could show that prehistoric people were saving the material they had. Whilst on the other hand, it could mean that the quantity of raw material was very limited. Thus,

[317] Zaliznyak, L., 1997, Mesolithic Forest Hunters in Ukrainian Polessye, BAR International Series, book 659, England, p. 63.
Sørensen, M., Rankama, T., Kankaanpää, J., Knutsson, K., Knutsson, H., Melvold, S., Eriksen, B. V., Glørstad, H., 2013, The First Eastern Migrations of People and Knowledge into Scandinavia: Evidence from Studies of Mesolithic Technology, 9th-8th Millennium BC / In: Norwegian Archaeological Review, p. 24.
Eriksen, B. V., information provided in a lecture, Zentrum für Baltische und Skandinavische Archäologie, 15 February, 2016.

[318] Zaliznyak, L., 1997, Mesolithic Forest Hunters in Ukrainian Polessye, BAR International Series, book 659, England, p. 22.

most likely all these presumptions would lead to the comprising conclusion that there was no time, no crucial need, yet also no opportunity to get some additional material at the moment the tools were made. Therefore it seems that the flint sources were indeed rather far away from the archaeological sites that were taken into consideration for this study.

Another pattern that was recorded in some of the lithic assemblages ascribed to Swiderian culture was the use of crested blades for tool production (Table 10). This behavior might be regarded as insignificant, yet it could implicate a lack of flint material experienced by prehistoric people and/or their manner to make implements quickly and without carrying about the aesthetics. Or, as it was interpreted in Saleninkai case, crested blades could have been prefered due to their size and proportions. Noticeably, mostly scraping tools were made out of these blanks. This pattern could be logically explained: most likely these tools were the last ones to be produced at the site during the hunting process (whilst the points could be regarded as made firstly, the burins and cutting tools – secondly, etc.), thus, the people might had to select from the blanks that were left. Still, as it was apparent from the flint assemblages studied, in the most cases there were still some suitable flakes discovered, and it has to be kept in mind that in this context the crested blades were chosen. It should be noted that the use of crested blades for tool making was recorded in some Swiderian sites to the south–southeast from Lithuanian border[319], yet it was not a pattern that could be described as very common. Instead, it could have something to do with the flinty and non-flinty areas, the latter maybe yielding more of these kind artifacts. This presumption should be revised and taken into consideration when evaluating the flint tool assemblages from South Lithuania, where flint material is easily accessable, and maybe some tendencies would then become apparent.

[319] Гурина, Н. Н., 1966, К вопросу о позднепалеолитических и мезолитических памятниках Польши и возможности сопоставления с ними памятников северозападной Белоруссии / In: Материалы и исследования по археологии СССР, У истоков древних культур (эпоха мезолита), No. 126, Москва, Ленинград, Fig. 4:31.
Janevic, A., 1999, Das Swiderien der Krim / In: Tanged points cultures in Europe (eds. Kozłowski, S. K., Gurba, J., Zaliznyak, L. L.), Vol. 13, Lublin, p. 36–46.
Libera, J., 1995, Późny paleolit i mezolit środkowowschodniel Polski, Część pierwsza (Part one): Analiza, 181 p.
Kozłowski, J. K., Kozłowski, S. K., 1977, Epoka kamienia na ziemiach Polskich, Warszawa, p. 199, Fig. 56:1, 57:12, 24.

Despite the quite distant places of flint exploitation, it seems that the first settlers of the area in focus had no difficulties to find them or to get the material by using social connections. The same opinion was already suggested in former studies of Lithuanian Stone Age archaeology[320]. This presumption could be also argumented by one case in the western part of the river Neris basin, when some different type of flint was probably imported to Samantonys site. At least one core of brownish-orange flint was worked in situ and several implements were produced. The assemblage was ascribed to Ahrensburgian technology on the basis of typical points that were discovered. The brownish-orange flint was of a very good quality, thus, most probably was selected carefully beforehand. An assumption could be made that either it was brought from the southeast, present territory of Belarus, or from the northeast, the upper reaches of the rivers Volga and Oka[321]. If any of these origins was proved, it would mean that some people in Final Palaeolithic might have had some contacts with people who were sourcing flint material really far away from the river Šventoji lower reaches where Samantonys site was situated.

On contrary to the situation depicted above, the lack of flint material was apparent after analyzing Neolithic assemblages from the same archaeological sites. The analysis has shown that either the later settlers did not have good connections and access to the best flint sources, or the flint debitage left behind after the first stages of site occupation was sufficient for their needs.

The use of other rocks than flint in the territory of concern has been recorded in several archaeological objects: Dūkšteliai 1, Pabartoniai 1, Pasieniai, Eiguliai 1, Neravai and in Vilnius 2 site. All the cases of non-flint rock use were different. In case of Pabartoniai 1 site, two knapped sandstone pebbles related to some archaeological features (stains) were unearthed. The refit analysis and visual examination of these finds had shown that most likely the flakes were not used for tool making, nor were they utilized. In addition, a

[320] Rimantienė, R., 1984, Akmens amžius Lietuvoje. Vilnius, p. 42–47.
Baltrūnas, V., Karmaza, B., Kulbickas, D., Ostrauskas, T., 2007, Egzotinė titnago bei titnago pakaitalų žaliava Lietuvos akmens ir žalvario amžiaus gyvenvietėse / In: Lietuvos archeologija, Vol. 31, Vilnius, p. 109–122.

[321] Baltrūnas, V., Karmaza, B., Kulbickas, D., Ostrauskas, T., 2007, Egzotinė titnago bei titnago pakaitalų žaliava Lietuvos akmens ir žalvario amžiaus gyvenvietėse / In: Lietuvos archeologija, Vol. 31, Vilnius, p. 114.

slight option remained possible that those sandstone pebbles had cracked naturally. However, as there were two identical specimens found in the same circumstances (both were not affected by fire), it would be difficult to interpret them as accidental finds related to geology instead of archaeology.

The case of non-flint rock use in Dūkšteliai 1 site was different: it was a polished boulder of granite, presumably dating to Mesolithic. Therefore this artefact should not be taken in comparison when flint and non-flint rock use is discussed. The same could be applied to the slate pebble found in Eiguliai 1 site that was related to flint knapping (see section *'Art'*), but was not a rock taken as a substitute for flint material. Whereas some quartzite-like rock working in Vilnius 2 site or knapping of other rock types recorded in Neravai and Pasieniai sites could be considered as very interesting, because these sites were situated on the border of the flinty area, and raw material was available in a close vicinity. However, it might be presumed that the use of quartzite and other rocks had more to do with the behaviour of prehistoric people and with the efforts put in usual activities and processes, than with the accessibility of flint sources.

The valley of the river Neris, as an area on the 'border' of flinty territory, was most likely regarded differently by different groups of people. For some people the flint sourcing was acceptable and they found it not difficult to go further to the north. As such, Swiderians could be mentioned, as their sites, even though very scattered, are found a few hundred of kilometres to the north from the flinty area. Yet at some point the lack of flint material in the northern lands might have pushed some groups of people back and most probably some people did come back and re-settled the river Neris basin or even more southern areas.

Contrarily to Swiderians, the groups of Brommean people are usually regarded as preferring territories where flint material can be accessed easily. Thus, as B. V. Eriksen has noticed, they were thinking from an economic perspective when a place for camping had to be chosen, but not when it came to flint working[322]. This presumption could be accepted also in regard of the

[322] Eriksen, B. V., information provided in a lecture, Zentrum für Baltische und Skandinavische Archäologie, 15 February, 2016.

river Neris basin archaeological data interpretation: the Brommean sites were situated not much further than the limits of the flinty area.

8.2 Mobility

As a basis for reconstruction of the possible mobility of the prehistoric people in the western part of the river Neris, a classification of four human behavioural categories (journeys, regular movements, pilgrimages, migrations) was taken into consideration[323]. All of them are important when discussing both the primeval settling of the territory, as well as its abandonment.

As it was described in the previous chapter (see '*Camping and living place selection'*), the settled places that we can investigate archaeologically were of some different types, first of all – of a temporary and a long-term type. Both could be dated to the same period of time, therefore it is apparent that Final Palaeolithic and Early Mesolithic groups neither sustained only by living a nomadic way of life, nor they were settled at one place for all the time. Thus, a 'homeland' should have been regarded as quite a large area of site-catchment, that involved various visited places. It could have reached hundreds of kilometres in width, as it was recorded in some of ethnographic peoples (Algonquians in North America, Aivilingmiut, Inuit, etc.[324]). However, some particular 'central' settlement where people spent decades of their life probably did not exist, as even long term sites were occupied for only some time – maybe one winter, or throughout several seasons. According to ethnographic data of Evenki people, a three months stay at one place should be considered to be a long one[325]. Some indigenous people consider four weeks as an optimal length of the stay at one place, as later the game animals start to avoid the area[326].

It would be a disputable question if a long-term site, once abandoned, was re-settled again after some time by the same group of people, but this manner of

[323] Zedeño, M. N., Stoffle, R. W., 2003, Tracking the Role of Pathways in the Evolution of a Human Landscape: The St. Croix Riverway in Ethnohistorical Perspective / In: The Colonization of Unfamiliar Landscapes, London, p. 59–80.
Andersson, M., Cronberg, C., 2007, Moving north – The first travellers to south Scandinavia / In: On the road. Stodies in honour of Lars Larsson, Acta Archaeologica Lundensia, Vol. 4, No. 26, p. 143–148.

[324] Zaliznyak, L., 1997, Mesolithic Forest Hunters in Ukrainian Polessye, BAR International Series, book 659, England, p. 63.
Rockman, M., Steele, J. (eds.), 2003, Colonization of Unfamiliar Landscapes: The archaeology of adaptation, p. 45.

[325] Taiga Nomads: Hundreds of Homes (Part 1), 1992, Documentary film series, Great Britain.

[326] Jochim, M. A., 1976, Hunter–Gatherer Subsistence and Settlement. A Predictive Model, New York, San Francisco, London, p. 51.

behaviour was recorded in many nomadic peoples[327]. Presumably, prehistoric people were constantly exploring the new areas and had many reasons to go further after some time: the search for social networks as well as termination of the old relations, ecological events, curiosity to discover some still unknown landscapes with presumed benefits. The opinion that the main reason for changing the location was a retreat of some fauna, reindeers in particular, is disputable, some archaeologists think it was important, yet not the most important push for migration[328]. These reasons could have led people to various directions – to the west where the biggest ever seen body of water existed and some products/articles of seal could have been exchanged, to the southern flinty areas or to the north where new unexplored landscapes were released from a retreated glacier and some new tribes of people could have been met. The self-evaluation of one family in the existing ecological situation and decisions to leave a place that was occupied for some time, depended on various factors, to number just a few: overlaying areas of site-catchment of two or more different groups of people (and a confrontation as a result); low demographic situation (and a lacking partners for further extension of the family as a result); relations to some other groups of people living far away, etc.

Whereas, during the long-term stay at one spot (notwithstanding its longevity) many journeys could probably have been organized. They could have been of different distance and related to various purposes, yet the common feature of all of them was an intention to come back. These kinds of journeys, if undertaken repeatedly, could be considered as regular movements, e.g. to the hunting campsite and back; to the flint sources and back. The long-term sites along the river Neris (e. g. Neravai, Skaruliai 2) could have been the starting points for journeys that took several kilometres away to the hunting or fishing places (e.g. from Skaruliai 2 to Skaruliai 1 site). In this case the area of people's movement comprised of up to few hundreds of kilometres. Whilst the

[327] Grøn, O., Kuznetsov, O. V., 2004, What is a Hunter-Gatherers Settlement? An Ethno-archaeological and interdisciplinary approach / In: Le Mesolithique / The Mesolithic, Section 7.1: Landscape-Use During the Final-Palaeolithic and Mesolithic in NW-Europe: The Formation of Extensive Sites and Site-Complexes, BAR International Series, book 1302, p. 47–53.

[328] Andersson, M., Cronberg, C., 2007, Moving north – The first travellers to south Scandinavia / In: On the road. Stodies in honour of Lars Larsson, Acta Archaeologica Lundensia, Vol. 4, No. 26, p. 145–146.

long-term sites situated near the lakes could be regarded as elements of a much wider territory of site-catchment, e.g. Dūkšteliai 1 site was situated dozens of kilometres away from the big river, and if people were willing to hunt in its valley or to find social connections there, they had to undertake journeys that lasted for a few days or even weeks. Their site-catchment should have been much broader. The water fetching or food product gathering spots can not be archaeologically recorded, yet it should be presumed that they were in the closest vicinity, as the gathered goods must have been brought to the long-term site quite frequently. However, as it was recorded in some inidigenous people (e.g. Selkupians or Huntians), sometimes even journeys lasting up to several days could be organized to reach some places where cedar nuts or some berries grow[329]. Thus, on the contrary to hunting, fishing, people meeting or flint sourcing places, they were not considered as determinant of the width of the site-catchment area.

The temporary sites, that were much more numerous than the long-term ones, were also informative. On the basis of lithic waste that remained, some particular activities and the size of an occupied area could have been reconstructed. The analysis of temporary sites found along the rivers Neris and Šventoji has shown that hunting and butchering had taken place in most of them, as well as flint knapping and tool production. These activities did not require a lot of space, therefore some of the sites were small, covering a few or barely a dozen square metres (e.g. Pabartoniai 1 site). It might be presumed that in most cases hunting tools and maybe some butchering (prey treatment) implements were made beforehand and were brought to the sites, whilst some flint knapping and tool production was undertaken after the process of hunting, to make as many butchering implements as were needed. Thus, it could be assumed that the hunters carried only basic implements as well as some flint material. The more skills they had, the fewer things they had to carry with them on travel to the hunting or fishing site. Maybe some flint sources were known in an area situated in between the living place and the hunting place, or

[329] Zaliznyak, L., 1997, Mesolithic Forest Hunters in Ukrainian Polessye, BAR International Series, book 659, England, p. 75.

very close to the hunting place, so that people could pay a visit there and take some material on their way. However, in the territory of concern, these kind of places would be difficult to find, yet maybe there were few of them on the left bank of the river Neris, to the south.

As it was previously mentioned (see section *'Camping and living place selection'*), large hunting places on the banks of the big rivers could have been seen as meeting points of some different groups of people who were using Swiderian as well as Ahrensburgian technology of tool making (Eiguliai 1, Skaruliai 1, Saleninkai 1, Drąseikiai, etc.). This type of sites could be compared to the Eskimo people settlement strategy, which was also called 'collecting' and was related to the reindeer hunt in particular. One of the main features of this type of strategy was collective hunts and cooperation among several groups of hunters. The large site then was established as a basic one, yet was surrounded by many other 'special camps' for additional activity (e.g. lookout points)[330]. Some small groups of people might have gathered for a big reason – a seasonal hunt, and might have shared the tasks notwithstanding the belonging to one or the other family. Thus, for example, one temporary site for butchering could have been occupied by only a few people who did the work, yet they could have been members of different groups and might have made their journeys to the hunting site from totally different living areas.

The other two categories of human mobility – pilgrimages and migrations – would be the most difficult to recognize in the archaeological data from the western part of the river Neris basin. Both of them are related to a particular destination. However, as no holy or sacred places have been identified in the territory of concern or in the neighboring areas, there is no possibility to discuss a pilgrimage case. Whereas migrations had been a question of debates for many years when the disappearance of Final Palaeolithic archaeological cultures, especially Swiderian, was discussed. On the basis of archaeological data obtained from the valleys of the rivers Neris and Šventoji only the small

[330] Andersson, M., Cronberg, C., 2007, Moving north – The first travellers to south Scandinavia / In: On the road. Stodies in honour of Lars Larsson, Acta Archaeologica Lundensia, Vol. 4, No. 26, Lund, p. 143–148.

scale movements of groups of people could be presumably determined, if ever actually proved. In the case of the river Šventoji valley, it could be assumed that some human groups in Final Palaeolithic or Early Mesolithic might have travelled along the river from the southwest to northeast or vice versa. Notwithstanding the target of travel, however, having in mind that the journey was done on foot, it could be presumed that they had to stop for camping at least for a few times at the same side of the river. The distance between a Swiderian site in Dvaronys and the lower reaches of the river Šventoji was around 90 km. Thus, some traveling people might have made up from 10 or 15 km per day[331] (depending on season and traveling conditions) and then have had to stop and rest, spend one or a few nights. The journey route then would correlate with the distribution of Samantonys site, which was approximately 30 km away on the left bank of the river. Therefore hypothetically these two sites might have been visited by the same Swiderian group. In addition, hypothetically their final destination might have been a big hunting site in Saleninkai, on the intersection of Šventoji and Neris rivers.

Another case that is worth mentioning is an interpretation of a relation among several sites on the basis of flint tool making technologies. Similar Early Mesolithic lithic finds found in Gudeliai and Kernavė 3 sites (also maybe in Jara site) could indicate that they were occupied by a very closely related or even the same group of people. The distance between Gudeliai and Kernavė 3 site was 32 km straight or 57 km if going along the river valley. Both sites were situated on the right bank of the river Neris. So, it would take approximately 11 hours, or, most probably, two days going on foot to reach the other site. It must be also noted, that most likely the groups of hunters were accompanied by at least several kids who had to learn hunting, and it could have become a factor limiting the distance those people were capable to make in one day.

The migration travels, even if there were many people who had crossed the river Neris basin while making their unidirectional journey, could not be

[331] Zaliznyak, L., 1997, Mesolithic Forest Hunters in Ukrainian Polessye, BAR International Series, book 659, England, p. 64.

archaeologically recorded. Yet if the migrations did happen, people should have paid at least some visits to a new land beforehand, as according to ethnographic data, no hunter-gatherer group had ever relocated into an unknown territory[332]. As the Final Palaeolithic Swiderian sites in the territory of concern are nearly the most northern ones (some sites were also discovered in the Daugava[333] river valley a few hundreds of kilometres further), it could only be presumed, that some of them could have been the final destination of the people who were traveling northwards, yet it would be impossible to determine if they did not turn back after a while. Whereas the territory that comprises the relatively small territory – the western part of the river Neris basin – could be regarded as one site-catchment area or even a part of one site-catchment area, as the territories covered by some indigenous peoples (Nunamiut or Inuit[334]) were known to have reached two or three times more square kilometres. Thus, it could have been crossed in various directions by many people and those journeys should not be considered as permanent relocations. Whilst if compared with the ethnographic data (e.g. the way of living of the Ojibway Indians[335]), scouting of new and useful lands should have been also part of the first Neris basin inhabitants' lives, yet the explored areas most likely were beyond the limits of the area which was the object of this study.

The relation between the river Neris basin and the river Daugava valley is also important. Both territories were inhabited by Late Swiderian groups of people, thus, most probably the western part of the river Neris basin (Šventoji river in particular) was a sort of 'corridor' connecting the flint mining places in the southern part of Lithuania with the Daugava valley reaching the Baltic Ice Lake, as the Northwestern Lithuania and its coastal area were somehow bypassed, and no Late Swiderian sites are known to have been situated there.

---

[332] Andersson, M., Cronberg, C., 2007, Moving north – The first travellers to south Scandinavia / In: On the road. Stodies in honour of Lars Larsson, Acta Archaeologica Lundensia, Vol. 4, No. 26, p. 143–148.

[333] Zagorska, I., 1995, Late Glacial and Early Postglacial finds in the Latvian coastal area / In: Man and Sea in the Mesolithic (*ed.* Fischer, A.), Oxford, p. 251–258.
Zagorska, I., 1996, Late Palaeolithic Finds in the Daugava River Valley / In: The Earliest Settlement of Scandinavia and its relationship with neighbouring areas (*ed.* Larsson, L.), Acta Archaeologica Lundensia, No. 24, Lund, p. 263–272.
Zagorska, I., 1999, The earliest settlement of Latvia / In: PACT, Vol. 57, Bergen, p. 131–156.

[334] Kelly, R. L., 1995, The foraging spectrum diversity in hunter gatherer lifeways, p. 112.

[335] Zedeño, M. N., Stoffle, R. W., 2003, Tracking the Role of Pathways in the Evolution of a Human Landscape: The St. Croix Riverway in Ethnohistorical Perspective / In: The Colonization of Unfamiliar Landscapes, London, p. 59–80.

8.3 Site abandonment

The reconstruction of the first settling of the river Neris basin would be without a doubt incomplete if the last stage of this process – the abandonment of the settled places – was not discussed. Actually, the view of a site, as we archaeologically find it and uncover, is the view of the place at its last moment just after the people left; it is not a direct picture that would be drawn in the middle of its occupation period. First of all, big part of attributes is already missing because people might have taken the most valuable implements and things. Secondly, the site re-settling for multiple times in the future as well as natural post-depositional processes predetermined a high destruction of that view. As it was exposed in Halle museum, Germany, once abandoned, the site can look quite telling, yet not much time was needed for the main features to be covered with Aeolian sand, vegetation, etc., and to become unrecognizable.

The abandonment of a temporary hunting campsite, on the contrary to the long-term living place, could seem more easily explained as the main reason for doing that was a finished task that had to be done. The list of things left behind could be various, yet obviously the lithic debitage after some flint working is the most apparent due to the best preservation. It might be only presumed that there should have been some waste from butchering work, which could have later attracted some forest predators. Thus, even if such material had been left after the site was abandoned, most probably it did not remain for longer than a week. However, if the slaughter was massive and there were a large number of animals killed, the non-butchered or partly butchered carcasses might have been left and not consumed before it started to rot. This kind of case would archaeologically be recorded as in Final Palaeolithic sites in Stellmoor tunnel valley, Germany[336]. However, according to the ethnographic data of the Nunamiut people, the cases when the number of slaughtered animals was sufficient, were relatively rare, and even if it would reach that level, people then would stop the killing[337].

[336] Rust, A., 1943, Die alt- und mittelsteinzeitlichen Funde von Stellmoor, Neumünster, Karl Wachholtz Verlag, 240 p.
[337] Binford, L. H., 1991, A Corporate Caribou Hunt. Documenting the Archaeology of Past Lifeways / In: Expedition: The magazine of the University of Pennsylvania, Vol. 33, p. 33–43.

Before the abandonment of a hunting site, especially if the hunt took place in the water or snow, prehistoric hunters had to stay for a while, dry their clothes and rest. Also a lot of post-slaughter work had to be done, therefore many spots then were occupied for butchering, fire making and other purposes, as it was recorded when observing the hunts of Nunamiut tribes. Therefore the flint tools left behind after the people were gone, could be concentrated in several places (as it was actually recorded in some of the sites in the river Neris basin).

The assemblage of the archaeological finds collected in hunting sites usually contained a few or a dozen flint points. Most of them were fragmented, yet some of these artefacts were left intact (e.g. in Drąseikiai, Eiguliai 1B, 1D, Kernavė 3, Mitkiškės, Radikiai, Saleninkai, Skaruliai 1, Vilnius 1 sites). The latter could be interpreted in different ways: either the wooden parts of the arrows were broken and hunters did not bother to fix them, therefore they might be seen as waste; or they were overlooked. These two options would be reasonable if it was presumed that unbroken arrows were valuable and should have been taken for reuse. Of course, an optional interpretation could be possible that people did not care about some arrows being left. Yet it would be more reasonable in the area where flint resources were easy to access, e.g. in Southern Lithuania, rather than in relatively non flinty valley of the river Neris.

However, in the case of Pabartoniai 1 site, an additional interpretation of the intact point leaving could be proposed. One of these Late Swiderian type of tools was found in some particular context: in an archaeological feature that was interpreted as a prehistoric hearth that had also contained some ochre. The dating of this object is still unclarified, but an unbroken and unburnt arrow found in such circumstances might be seen as left intentionally. This presumption, if ever proved, could give a reason to assume that some little number of artefacts that are usually discovered in the Final Palaeolithic and Early Mesolithic sites could have been left with purpose related to some beliefs of good luck for future hunts. Then it might mean that at the moment of site abandonment people actually thought about what they could (or even had to) leave behind and cared about the things they should take with them.

In general, the number of arrows used during the process of the hunt must have been much more numerous, but was not recorded due to several reasons: 1) some of them were not found by archaeologist, 2) (the biggest?) part of them could have been collected by hunters and taken away, 3) some hunting tools had to remain in the water if the hunt took place in the river or a lake. Thus, it could be presumed that archaeologically we could record a smaller part of the tools that were actually utilized at the site, unless it was abandoned very quickly or because the depart was complicated (e.g. bad weather conditions).

Most of the temporary sites in the river Neris basin that were situated in sands, were later exposed, covered and re-exposed for many times. The later settling of the very same spots in Mesolithic, Neolithic and Bronze Age implicate that by the time some newcomers had arrived, the signs of previous settlements could have been easily recognized, the lithic assemblage laying on the surface in particular. A number of sites in the territory of concern have yielded flint artefacts with marks of later retouch (Kernavė 3, Dūkšteliai 1, etc.). Therefore it was apparent that later settlers have used some part of lithic debitage and tools of their predecessors. Presumably, they regarded those sandy places with flint flakes laying on the ground as flint material sources that could have been exploited for their needs. Having in mind that some Neolithic people were living sedentary, it could have had a big impact on the Final Palaeolithic or Early Mesolithic archaeological material preservation. The case of Dūkšteliai 1 site has shown that those remains may become almost invisible. Comparing with Final Palaeolithic/Early Mesolithic demographic situation to Neolithic, a conclusion could be made that a big part (if not most) of the earliest sites seem to be missing only due to their later exploitation. On the other hand, the sites left by the first visitors created a new 'network of flint sources' for their followers, who got to know the same landscape totally differently because of this reason. Thus, on the contrary to the Final Palaeolithic or Early Mesolithic situation, the Neolithic communities did not settle a territory completely free of flint material and therefore could have had a lower level of dependence on the flint mining places in Southern Lithuania.

9. INTELECTUAL BASIS OF THE FIRST INHABITANTS

The archaeological data obtained from various investigated sites in the territory of focus could be regarded as promissing only for the analysis of the physical context of prehistoric humans. Despite that, in this study it was presumed that some artefacts as well as the ethnographic knowledge about some peoples could be taken into discussion when trying to reconstruct the first inhabitants' intelectual basis. Some insights on the topics related to people's creativity, beliefs and way of thinking are suggested in this chapter. However, it has to be admitted that this field is without a doubt the least cognizable. It can be only interpreted and, perhaps, never explained in details.

9.1 Art

In the generalized picture of the European Upper Palaeolithic one of the most preeminent features is ascribed as the birth of Human ability to create art. Starting from the very beginning of the archaeological research of this period, the quest for art attributes in the material culture of *Homo sapiens* was essential. It is already widely accepted, that most of the art branches – sculpture, engravings, painting and drawing – were all well known in Upper Palaeolithic Europe[338]. Whilst in Mesolithic the portable art is more or less spread in all the European regions and the skill to ornament a piece of bone or stone is observed in many places, Northeastern Europe as well[339].

In this wide context that I will not describe in details, Lithuanian archaeological data is just a little crumb as there is so little that can be found from Palaeolithic. According to recently given archaeological overviews, there

[338] Zervos, Ch., 1959, L'Art de l'époque du renne en France, 499 p.
Graziosi, P., 1960, Palaeolithic Art, 290 p.
Leroi-Gourhan, A., 1971, Prähistorische Kunst: Die Ursprünge der Kunst in Europa / In: Grose Epochen der Weltkunst, Ars Antiqua, Freiburg, 602 p.
Breuil, H. A., 1974, 400 siècles d'Art Pariétal. Les cavernes ornées de l'age du renne, Paris, 412 p.
Marchack, A., 1983, European Upper palaeolithic–mesolithic symbolic continuity. A cognitive, comparative study of ritual marking / In: Proceedings the intellectual expressions of prehistoric man. Art and religion, p. 111–120.
Milisauskas, S., 2002, European Prehistory: A Survey, New York, 445 p.
Wildgen, W., 2004, The Paleolithic origins of art, its dynamic and topological aspects, and the transition to writing / In: Semiotic Evolution and the Dynamics of Culture, Vol. 5, Germany, Bern, p. 111–148.
Bouvry, F., 2008, Une anthropologie des manifestations esthétiques du Mésolithique européen de la fin du Tardiglaciaire et durant le Postglaciaire, 643 p.
Veil, S., Breest, K., Grootes, P., Nadeau, M. –J., Hüls, M., 2012, A 14 000-year-old amber elk and the origins of northern European art / In: Antiquity, 86, p. 660–673.
Cook, J., 2013, Ice Age Art: The arrival of the modern mind, The British Museum press, 288 p.

[339] Płonka, T., 2003, Portable art of the early Mesolithic, Wrocław, 612 p.

are no portable art artefacts made from flint in the Eastern Baltic region[340]. Thus, it can be presumed that the first settlers who entered Lithuanian territory might have known (or at least must have heard about) the technologies to prepare color pigments, to engrave softer or harder material (wood, bone, antler, various types of rock), to mold some form out of clay, to paint and draw by hands and using some special implements. There are no rock shelters or caves in Lithuanian landscape, and most of the sites are situated on the sandy banks of the rivers. Due to the poor archaeological material preservation mostly stone finds and burnt organic material (e.g. bone) can be found. As follows, only portable art could have existed at that time in Lithuania and out of all of it basically only stone artefacts could now be discovered.

Not much could be said about the Early Mesolithic portable art, though there are only a few dozen artefacts in Europe that could be dated as early as the Preboreal period. These are some engraved pieces of bone, amber or stone, which in most cases had a faint linear ornament and therefore sometimes were not even published[341]. Therefore if the problem of inspiration sources in Late Palaeolithic art can be discussed in Southern and Central Europe, and some aspects of ornamented Mesolithic artefact functions can be considered in Northern Europe region, in Lithuanian territory we shall in general search for any evidence of Final Palaeolithic art.

The quest for art attributes has started from the early 70s[342]. After some excavations led by R. Rimantienė in the lower reaches of the river Neris some artefacts that can be attributed to the expression of Palaeolithic art were found and suddenly were included into the discussion[343]. One of the finds was a slate pebble with some linear carvings on both sides, discovered in Eiguliai 1A site on the left bank of the river Neris[344] (see section *'Eiguliai 1 site'*). The site also

[340] Boroń, T., Królik, H., Kovalski, T., 2011, Antropomorficzna plastyka figuralna krzemienna i kościana w społecznościach pradziejowych z ziem Poskich / In: Archeologia Polski, Vol. 56, p. 80.

[341] Clark, J. G. D., 1936 (2014), The Mesolithic Settlement of Northern Europe, 318 p.
Płonka, T., 2003, Portable art of the early Mesolithic, Wrocław, p. 25–28.

[342] Римантене, Р. К., 1971, Палеолит и мезолит Литвы, Вильнюс, 204 p.
Rimantienė, R., 1984, Akmens amžius Lietuvoje, Vilnius, 343 p.

[343] Римантене, Р. К., 1971, Палеолит и мезолит Литвы, Вильнюс, p. 40–42.

[344] The same, p. 40, 42, pic. No. 24.

yielded a lot of flint artefacts and was considered to be inhabited at least for two times: in Final Palaeolithic and Neolithic[345]. The find was described as a 900x700 mm slate pebble with some carvings done with a flint burin[346]. Later R, Rimantienė added that this engraved pebble could be related to magic or art[347]. There was no suggestion, what the engraved lines might mean, and no discussion on the function of this artefact has been started. After twelve years it was repeatedly described in the literature, but no specified explanation of its meaning was proposed[348]. Whereas according to the latest division of the art forms known in Upper Palaeolithic Europe in the end of 20th century it could have been attributed to the portable art or *art mobilier*[349].

In the beginning of the 21st century a very similar 250x400 mm size pebble was found in Mesolithic Sudota 3 site, in Eastern Lithuania[350], around 140 km away northeastwards from Eiguliai 1A site. It was also considered to be engraved with some burin-like tool[351]. Unfortunately, the engravings did not form any meaningful figures and were indecipherable.

Throughout the next years of investigations on Lithuanian prehistory the existence of Palaeolithic art was still not under discussion, whilst Mesolithic features of religion that could be compared to some sort of art expression, were taken into concern. However, it was admitted that there are no artefacts in Lithuanian territory from this period that could be directly assigned to artwork[352]. The engraved pebbles from Eiguliai 1A and Sudota 3 were not neglected as being found, but neither were they further investigated. They were studied more attentively when the earliest non-flint rock artefacts found all over Lithuania were analyzed. A conclusion has been made that the engraved

[345] Яблонските-Римантене, Р., 1959, Стоянки каменного века в Эйгуляй / In: Вопросы этнической истории народов Прибалтики, Москва, p. 11–31. Римантене, Р., 1968, Исследования стоянки каменного века в Литве, проводившиеся в 1948–1967 гг. / In: 20 лет: Материалы к отчетной конф. Археолог. и этногр. Экспедиции Ин-та истории АН Лит. ССР 1948–1967 гг., Вильнюс, p. 17.

[346] Римантене, Р. К., 1971, Палеолит и мезолит Литвы, Вильнюс, p. 40.

[347] Rimantienė, R., 1984, Akmens amžius Lietuvoje, Vilnius, p. 55.

[348] Rimantienė, R., 1996, Akmens amžius Lietuvoje, Vilnius, p. 52.

[349] Wildgen, W., 2004, The Paleolithic origins of art, its dynamic and topological aspects, and the transition to writing / In: Semiotic Evolution and the Dynamics of Culture, Vol. 5, Germany, Bern, p. 114.

[350] Šatavičius, E., 2005, Svidrų kultūra Lietuvoje / In: Lietuvos archelogija, Vilnius, Vol. 29, p. 294.

[351] Personal consultation with E. Šatavičius, 2011.

[352] Juodagalvis, V., 2008, Mezolitas / In: Lietuvos istorija. Akmens amžius ir ankstyvasis metalų laikotarpis, Vol. 1, Vilnius, p. 97. Girininkas, A., 2009, Lietuvos archeologija: Akmens amžius, Vol. 1, Vilnius, p. 114.

pebbles have an unsolved purpose or meaning, but as no actual information was encoded into the engravings, the theory of their belonging to prehistoric magic or art was neglected[353]. Although some new ideas that the engravings might have been made by cutting something that was put on the pebble or that it was an abstract unconscious 'drawing' without a special purpose were suggested. While the main theory that the pebbles were engraved with some sharp tool was accepted.

In 2013 the question of the engraved pebble purpose was retraced by the author of this study after analyzing the first inhabitance of the river Neris lower reaches. Eiguliai 1A pebble was closely studied again, however, no clarifying conclusions were made as there were only a few comparative examples found in Northern Europe. At first it was noticed that the pebble itself was not polished or shaped before engraving, although that manner of making an engraved art piece was common in Mesolithic[354]. Also, it had no engraved edges – there were only incised lines on the obverse and the backside of a pebble. It seemed that the lines were made in a fast way, not thinking about a concrete drawing as a result that had to be achieved, differently from other known incised artefacts, e.g. the ones from Roc de Marcamps (France)[355] or Balma de la Margineda (Andorra)[356]. While the slate plates with engravings found in Southwestern Europe usually had visual information depicted and the figures of animals or ornaments are understandable to modern human mind[357]. If the engraved plate was only one of some fragments of a bigger art work, e.g. the plates found in Cova del Parpallo or in Roc de Sers Palaeolithic sites, the engraved lines could not resemble any recognizable figure[358]. Also, there were examples of perforated engraved plates in Gravettian sites (e.g. Saut-de-

[353] Rimkutė, G., 2012, Netitnaginių uolienų apdirbio technologijos ir dirbinių gamyba finaliniame paleolite-mezolite Lietuvoje / In: Archaeologia Lituana, Vol. 13, Vilnius, p. 60.

[354] Marshack, A., 1970, New techniques in the analysis and interpretation of Mesolithic notation and symbolic art // Actes du Symposium International d'Art Préhistorique, Valcamonica Symposium, Capo di Ponte, p. 479-480.

[355] Marshack, A., 1979, European Upper Palaeolithic–Mesolithic symbolic continuity: A Cognitive, Comparative Study of Ritual Marking / In: Valcamonica Symposium III, The Intellectual Expressions of Prehistoric Man: Art and Religion, p. 117, Fig. 70.

[356] Płonka, T., 2003, Portable art of the early Mesolithic, Wrocław, p. 330, Fig. 3:3.

[357] Pales, L., 1981, Les gravures de la marche, Vol. 1–4.

[358] Schmidt, R. R., 1922, Die Kunst der Eiszeit.
Villaverde Bonilla, V., 1994, Arte paleolitico de la Cova del Parpallo. Estudio de la coleccion de plaquetas y cantos grabados y pintados, Vol. 2, 316 p.
Tymula, S., 2002, L'arte solutréen du Roc de Sers (Charente) / In: Documents d'archéologie française, Vol. 91, Paris, 165 p.

Perron)[359]. However, the Eiguliai 1A pebble had no broken edges, therefore it was a non-fragmented artefact, and no other manufacture techniques (that could add more artistic value) were used to form it.

However, some examples of non-decipherable engraved stone plates also come from Upper Palaeolithic Magdalenian period. The plates in Les Eyzies or La Marche in France yielded some limestone and schist artefacts with engravings which cannot be understood as depicting some sort of figure, but are certainly engraved on purpose and some systematic engraving still can be seen[360].

Probably the closest similar portable art artefact is an engraved sandstone from Radgoszcz 15 site, Poland, that is supposed to belong to Swiderian or/and Ahrensburgian culture[361]. It is quite similar in size (8,5 by 10,5 cm) and flat form, but the engravings are far too different to resemble the Eiguliai 1A pebble: the sandstone from Radgoszcz 15 has only a few stripes that are incised vertically and horizontally by making a drawing of '+' or 'x' shape.

After visually examining the surface of the engraved pebble in 1950s, R. Rimantienė has given a note, that „the engraved lines intersect in acute instead of perpendicular angle". A conclution was made that probably a slate pebble was not used simply for cuting something on it, but was intentively engraved[362].

Some similar Mesolithic engraved pebbles were also found in Sweden, although the engraved lines were a bit too straight and done with more strenght, with a determined exact direction. Despite the straightness of the lines, it was not considered as an art drawing. Instead, it was more likely used to work the edges of flint blades and flakes. Those pebbles were somehow polished and had a very flat surface – an essential feature for working a blade edge[363]. Therefore

[359] Sieveking, A., 1987, Engraved Magdalenian Plaquettes: a regional and stylistic analysis of stone, bone and antler plaquettes from Upper Palaeolithic sites in France and Cantabric Spain, BAR International Series, book 369, p. 100.

[360] The same, p. 7, plate 2a–b.

[361] Kowalski, K., Płonka, T., 2011, New ornamented artefacts from the Polish Lowland and Final Palaeolithic Symbolism / In: Humans, environment and chronology of the Late Glacial of the north European Plain, p. 180–181.

[362] R. Rimantienė's written depiction of Eiguliai 1A site in the National Museum of Lithuania.

[363] Clarke, A., Vila, A., Estevez, J., Hardy, K., 2012, The Tie That Binds? An incised Mesolithic bevelled pebble from Camas Daraich, Skye / In: Mesolithic Miscellany, Vol. 22, No. 1, p. 3–9.

comparatively the pebble with engravings from Eiguliai 1A is a typologically and functionally different artefact, because the engraved lines are not as deep and regular. Whilst the surface polishing is a disputable clue as pebbles usually are naturally polished in the sand by post-depositional processes.

Another similar engraved pebble was found in Mousterian site of Petit abri de Laussel, Dordogne region, France. An interpretation was given that it could have been a stone used to rub some plants on it[364]. However, that kind of activity would probably not result in such straight lines on the surface, as the friction would be between two blunt pieces of rock. So even though it has a little resemblance to Eiguliai 1A plate, the functional interpretation should be different.

In 2017 a microwear analysis of the Eiguliai 1A engraved slate pebble has been made under a microscope by the author of this study. By that time the artefact was kept in the museum with no special treatment done. It was put into a wooden drawer separately and its surface most probably had no contact with other finds.

After examining the pebble under the microscope at some basic features of the surface use-wear were identified:

1) The linear engravings on both sides of the pebble were highlighted and studied rotating the 'pictures' 360° (Fig. 113–114). Analysis has shown that no identifiable figure could be recognized. After giving the pictures to 3–7 years old children, no conforming opinions of the 'picture' could be determined, though some children have argued that a picture could be depicting a bunch of branches, trees, human feet in the water, etc. The results of this small non-scientific study have proved that modern human mind does not recognize any actual drawing engraved on the pebble surface.
2) The engravings were of different width, depth, direction and length (Fig.

Sjöström, A., Nilsson, B., 2009, 'Rulers' of southern Sweden: technological aspects of a rediscovered tool / In: Mesolithic Horizons. Papers Presented at the Seventh International Conference on the Mesolithic in Europe, Belfast 2005 (*eds.* McCartan, S. B., Schulting, R., Warren, G., Woodman, P.), Vol. 1, p. 788–794.

[364] de Beaune, S. A., 2000, Pour une Archéologie du geste, Paris, planche VII.

113–114). On one side two basic directions could be identified, whilst on the other side only one direction is dominant, however, many lines did intersect and some were of totally opposite direction. These features showed that the engravings were made not at once, but in many separate movements. Also, a tool of different width and sharpness was used every time the engravings were added. Moreover, the pressure strength used to engrave the pebble had also differed. The multidirectional layout of the lines was related to the ways the artefact was kept in the hands.

3) The engraved 'pictures' on both sides of the pebble had no margins left (Fig. 113–114). Some lines were engraved ending on the very edge of the artefact. Thus, the lines were made in a fast undetermined and uncontrolled way.
4) On one side of the pebble there are more lines engraved than on another. It shows that the first side was used more often or more time was spent to engrave it. However, the lines on the more intensively used side are much thinner and shorter.
5) Some engravings are of 'V' profile form, whilst others are of 'denticulate' (VVV) form. This feature has a correlation with the interpretation that the engravings were made with a flint burin. If a burin was used, the lines profile could and should differ, however, it seems that the burin should have been used on many various angles to make so many different width engravings. Also, this could have been the result of a number of burins used for engraving. Nevertheless the idea that the engravings were made using a sharp flint angle/edge can be accepted.

The features listed above implicate that the pebble from Eiguliai 1A site was not engraved with an intention to draw a picture and create portable art artefact. Neither was it engraved to code some visual information that should have been transferred. Instead, it was used to work something else. Most probably – to rub or rasp something, and the engraved lines are the use-wear traces left after the work. It was most probably rasped into a sharp thing that

could have been flint. Therefore this tool might have been a plate used to rasp flint core edge before knapping.

This theory was proved after discussing it with modern flint knappers (personal consultation with Dr Frank Moseler and Algimantas Kensminas in 2014–2015), who have admitted using sandstone or slate pebbles for flint core edge rasping. Whilst it is also acceptable to use the hammer stone (usually quartz or granite) for the same purpose, professional flint knappers usually have an additional pebble of softer rock. This theory also explains why both sides of the pebble were engraved and why the engraved lines were so different, made in a fast undetermined way. The specific use of this tool determined non selective utilisation of both sides as it was convenient at the certain moment of flint working process.

As a result, a new perspective to the Eiguliai 1A engraved pebble can be given. It had just the same formless gravings without certain directions as the one flint knapper A. Kensminas had. Also the size of it was more or less the same. According to the flint knapper, he has chosen it after two very clear features: it had to be some soft rock and had to fit the hand.

The similarity of the archaeological finds and the modern rasping tool was obvious. In order to check this hypotheses, an other flint knapper from Germany, archaeologist F. Moseler was also interviewed. He has approved having the same pebble for rasping the edge of the flint core, and said that the main reason for taking it was because it was not convenient to rasp flint with the hammer, which is harder than sandstone. However, not all flintknappers use an additional tool for flint core rasping. According to the professional flint knapper and experimenter Harm Paulsen, an additional pebble is not needed in a flintknapping process and it is much faster to do it with only one tool in your hand.

To conclude, modern specialists of flintknapping techniques use two ways of rasping the edge of the core: using a tool from a softer rock, and not using any additional tool. There could have been also the same division in techniques used in prehistoric times. At this point, Eiguliai 1A slate pebble

could be considered as an additional tool. That could implicate that Swiderian people in the lower reaches of the river Neris might have had a flint working toolkit of a greater variety. While Polish archaeologists interpret the engraved sandstone from Radgoszcz 15 as having some symbolic relation to flint core and blade production[365], the Eiguliai 1A pebble should be regarded as non symbolic, but a practical tool related to the same activity.

In the discussion on the engraved stones and flint working relation, a find from Upper Palaeolithic site Windeck (Sieg valley, Germany) has to be mentioned. A probable flint hammer was found with some traces of hitting and figures of animals engraved[366]. This find implicate that a hammer stone could have had a symbolic meaning and might have been used for a long time, presumably, by the same person, but Eiguliai 1A pebble was too flat to be used as a hammer.

In the investigation of the earliest art evidence in Lithuania, another artefact from the area of focus has to be studied – a flint artefact from Skaruliai 1 site, found on a sandy surface during one of the R. Rimantienė's and her father's K. Jablonskis visits to the site in 1938–1940 (Fig. 100:1). In her diary[367] R. Rimantienė has written a description of the artefact:

> *'Out of other implements I have to first mention one little bladelet with four notches retouched and both ends broken. As the artefact is with ortstein coloring, it can be added to the Palaeolithic collection of other finds of the same color. (We have to look at this artefact as to a visual art thing – anthropomorphic and with a magic meaning)'*

The 'anthropomorphic figurine' was made from a blade with both ends detached. It had two pairs of notches on both sides almost symmetrically formed with a steep retouch from the dorsal side. Nevertheless it was ascribed to Final Palaeolithic finds, the blade processing technology used to make this artefact

[365] Kowalski, K., Płonka, T., 2011, New ornamented artefacts from the Polish Lowland and Final Palaeolithic Symbolism / In: Humans, environment and chronology of the Late Glacial of the north European Plain, p. 179–185.

[366] Street, M., Gelhausen, F., Grimm, S., Moseler, F., Niven, L., Sensburg, M., Turner, E., Wenzel, S., Jöris, O., 2006, L'occupation du bassin de Neuwied (Rhénanie centrale, Allemagne) par les Magdaléniens et les groupes à Federmesser (aziliens) / In: Bulletin de la Société préhistorique française, Vol. 103, No. 4, p. 764.

[367] The diary is available in National Museum of Lithuania, Vilnius.

was more likely to be Mesolithic: the blade was very regular, detached from an unipolar core. The patina covering factor was not taken into account as a dating criteria. However, it was weaker than some of the Final Palaeolithic finds from Skaruliai 1 site. Besides, it was discovered on a surface.

The artifacts from Skaruliai 1 site were was partly published in late 1960s it by W. Taute as a typical assemblage of European Final Palaeolithic[368]. A drawing of the flint blade was presented and described as 'unique' (Unikum). Following the term previously proposed by R. Rimantienė[369], it was characterized as a 'notched blade' (Randkerben). In discussing the uniqueness of this artefact it is important to note that there were more lithics with retouched notches in Skaruliai 1 site, thus, this pattern should be considered as common. However, this type of notched blades lacks analogies in other sites of similar dating around Europe. It could be found in Magdalenian sites in France and a bit closer to river Neris region – e.g. in Kamenaja Balka 2 site in Russia, where they were named 'notched implements (borer)' (выемчатое орудие (проколка))[370]. R. Rimantienė has probably found the most resembling analogue in Les Grottes de Grimaldi site, but at the same time she has also noticed, that even the french archaeologists did not guess the purpose or the function of this artefact. Whilst R. Rimantienė proposed to relate the notched blade to religion, and to consider it as a figurine. However, it seems that Les Grottes de Grimaldi site was settled in Late Palaeolithic–Neolithic, therefore it cannot be taken as a comparative analogue for determining the Skaruliai 1 artefact dating. Whereas typologically the blade could find a place in the J. Bordaz systemized flint finds table, published nearly 50 years ago and be named a 'bilaterally denticulated bladelet'[371].

Blades with notches (usually not so regular and symetrical as on Skaruliai

[368] Taute, W., 1968, Die Stielspitzen-Gruppen im Nördlichen Mitteleuropa. Ein Beitrag zur Kenntnis der späten Altsteinzeit / In: Fundamenta, A-5, Böhlau, Verlag, Köln, Graz, p. 158, Fig. 158–159.

[369] Jablonskytė, R., 1941, Akmens amžiaus stovykla Skaruliuose (Jonavos v., Kauno a.) / In: Vytauto Didžiojo Kultūros muziejaus metraštis, Kaunas, Vol. 1, p. 13–14.
Taute, W., 1968, Die Stielspitzen-Gruppen im Nördlichen Mitteleuropa. Ein Beitrag zur Kenntnis der späten Altsteinzeit / In: Fundamenta, A-5, Böhlau, Verlag, Köln, Graz, p. 158 and Taf. 159, Fig. 11.

[370] Першиц А. И., Монгайт А. П., Алексеев В. П., 1974, История первобытного общества: Учебник, p. 87.
Гроздовер, М. Д., Леонова, Н. Б., 1977, Клад кремня из верхнепалеолитической стоянки Каменная Балка II / In: Проблемы палеолита восточной и центральной Европы, p. 127–136.

[371] Bordaz, J., 1970, Tools of the Old and New Stone Age, New York, 146 p.

blade) were found in Final Palaeolithic sites of Ahrensburgian culture, and were named 'Teilretuschierte Klingen'[372]. There were also a few sites in Ukraine where notched blades were identified – Pushkary 1 and Mezina site. The latter yelded 62 flint finds ascribed as blades with scraper-notches on the sides (пластинки с выемками-скребками по краям)[373]. These artefacts were interpreted as scraping implements on the basis of typological-logical assumptions.

The similar blades with notches were found in Mesolithic sites in France as well. They were described as 'lamelles encochées', 'lames à encoche' or 'lames à coche'. The function of these blades was also interpreted as scraping[374]. It could have been a continuous tendency of interpretation followed for at least 80 years among French archaeologists, since already in the early 1920s a term 'grattoir concave (simple)' (a simple concave scraper) was suggested for the Late Palaeolithic Aurignacian notched blades[375]. However, it would be incorrect to ascribe this kind of interpretation to Skaruliai 1 notched blade, as its notches are a bit too symetrical and formed too close to each other for using it as a scraper and keeping in a hand (or even for putting it into a handle). Similar artefacts are called 'Laminillas Montbani' in Spain and usually are found along with microlithic trapezes, therefore they are ascribed to Tardenoisian tradition and dated to epi-Palaeolithic period[376]. Whereas some Mesolithic notched blades were also found a bit closer to Lithuanian territory, in Duvensee site in Schleswig-Holstein, Baume de Montclus and WeeldePaardsdrank sites in Germany[377].

The anthropomorfic figurines made from flint undoubtedly existed in

[372] Dürre, W., 1971, Fundplätze der Ahrensburger Kultur im Kreise Soltau / In: Material hefte zur Ur-und Frühgeschichte Niedersachsens, Heft 4, 100 p.

[373] Борисковський, П. І., 1949, Палеоліт і неоліт України, Археологічні досліди на Десні, Vol. 1, Kiev, p. 162.

[374] Brézillon, M. N., 1968, La dénomination des objects de pierre taillée: matériaux pour un vocabulaire des préhistoriens de langue française / In: IV[e] supplément à Gallia préhistoire, Paris, p. 259.
Шовкопляс, И. Г., 1965, Мезинская стоянка, Киев, p. 158–160, tab. XXIV.
Ed. Séara, F., Rotillon, S., Cupillard, Ch., 2002, Campements mésolithiques en Bresse jurassienne, Paris, p. 171, Fig. 127:4–19.

[375] Dr. Capitan, 1922, La Préhistoire, Collection payot, Planche VI, Paris, 157 p.

[376] Merino, J. M., 1980, Tipologia litica / In: Munibe, Suplemento No. 4, p. 251–253.

[377] Bokelmann, K., 1971, Duvensee / Monographie eines mesolithischen Wohnplatzkomplexes in Schleiswig-Holstein / In: Inaugural dissertation zur Erlangung des Doctorgrades der Mathematisch-Naturwissenschaftlichen Fakultät der Universität zu Köln, p. 5–26.
Gehlen, B., 2012, Grundformproduktion und –verwendung im späten Mesolithikum Mitteleuropas / In: Steinartefakte: Vom Altpaläolithikum bis in die Neuzeit, Tübingen, p. 553, Abb. 4:A–B.

Neolithic and Bronze Age in the Northeastern Russian plain[378]. However, some earlier examples from Europe had no such recognizable forms and were usually interpreted as figurines primarily because they were made by retouching a flake all or almost all around its perimeter and were not regarded as implements. This interpretation was also proved after examining the artefacts under the microscope, as almost no traces of use-wear were found[379]. Also some random-form flint figurines made from flakes with flat retouch were identified in Sukhona River basin, Russia, but typologically they differed from Skaruliai 1 notched blade[380].

An opinion exists, that in Northeastern Baltic region there were no portable art artefacts made from flint[381]. While not many anthropomorfic flint figurines were found or at least were recognized as pieces of portable art in other parts of Europe as well[382]. Most of them were discovered in big sites, where full-scale excavations were undertaken[383]. Taking the blade from Skaruliai 1 into comparisson, unfortunately, it cannot be considered as similar because of a few reasons. First of all, it was made from a regular blade, not a flake. This is a meaningful difference in the flint tool processing technique. It was also retouched in a different manner, making only symmetrical notches on sides instead of forming a certain figure by retouching the entire blank perimeter. In addition, it was retouched only from the dorsal side. The third difference was already discussed – usually flint figurines are dated to a much later period, and even if the artefact in focus was of the same type, on the basis of typology it

[378] Kashina, E., 2002, Anthropomorfic flint sculpture of the European Russian forest zone / In: Anthropologica et Praehistorica, Vol. 113, p. 51–60.

[379] Замятнин, С. Н., 1948, Миниатюрные кремнёвые скульптуры в неолите северо-восточной Европы / In: Советская археология, Vol. 10, p. 85–123.
Fiedorczuk, J., Bratlund, B., Kolstrup, E., Schild, R., 2007, Late Magdalenian feminine flint plaquettes from Poland / In: Antiquity, Vol. 81, p. 98–99.
Boroń, T., Królik, H., Kovalski, T., 2011, Antropomorficzna plastyka figuralna krzemienna i kościana w społecznościach pradziejowych z ziem Poskich / In: Archeologia Polski, Vol. 56, p. 65–88.

[380] Недомолкина, Н. Г., 2000, Сухонские кремневые фигурки / In: Тверской археологический сборник, Выпуск 4, Vol. 1, p. 224–232.

[381] Boroń, T., Królik, H., Kovalski, T., 2011, Antropomorficzna plastyka figuralna krzemienna i kościana w społecznościach pradziejowych z ziem Poskich / In: Archeologia Polski, Vol. 56, p. 65–88.

[382] Fiedorczuk, J., Schild, R., 2002, Wilczyce – a new Late Magdalenian site in Poland / In: Recent studies in the Final Palaeolithic of the European Plain, Proceedings of a UISSP Symposium, 1999, Vol. 39, p. 91–100.
Pigeot, N., 2004, Les derniers magdaléniens d'Étiolles. Perspectives culturelles et paléohistoriques / In: Suplément à Gallia Préhistoire, No. 37, 360 p.
Fiedorczuk, J., Bratlund, B., Kolstrup, E., Schild, R., 2007, Late Magdalenian feminine flint plaquettes from Poland / In: Antiquity, 81, p. 97–105.
Shild, R., 2009, Paleolityczne figurki kobiet z Wilczyc / In: Archeologia Żywa, Vol. 4, p. 8–11.
Boroń, T., Królik, H., Kovalski, T., 2011, Antropomorficzna plastyka figuralna krzemienna i kościana w społecznościach pradziejowych z ziem Poskich / In: Archeologia Polski, Vol. 56, p. 65–88.

[383] Weniger, G.-C., 1989, The Magdalenian in western central Europe: settlement pattern and regionality / In: Journal of World Prehistory, Vol. 3, p. 323–372.
Boroń, T., Królik, H., Kovalski, T., 2011, Antropomorficzna plastyka figuralna krzemienna i kościana w społecznościach pradziejowych z ziem Poskich / In: Archeologia Polski, Vol. 56, p. 65–88.

would probably relate to Neolithic or Bronze Age. Then it could not belong to the earliest inhabitants of the river Neris valley.

The notched flint artefacts, if you took any of them, are really interesting and worth a closer examination. Skaruliai artefact has both ends detached and that makes it even more difficult to interpret, because there will always be a question, if only a fragment of this artefact remained. The notches should probably not be related to the tool processing technique, e.g. blade division and microlith production steps. Following the reconstruction of the microlith production, proposed by J. Bordaz, there would be too many notches retouched in a rather short interval on both sides. In addition, the blade was broken not in the notched place[384] (Fig. 100:1). However, the perception of blades with only one notch on a side as a microlith production waste was well known for a long time[385].

Skaruliai 1 blade could have been only a part of a thing combined of leather, fur, some strings, etc., and without having the lost organic details of the artefact, a reconstruction of its appearance or way of use could not be possible. Nevertheless, it was also examined under the microscope for this study with a purpose to specify its function. The analysis was made after the find was kept together with other flint finds for a few decades before. Therefore presumably this artefact could have had some use-wear traces on the edges resulted by the friction with other flint finds. Notwithstanding this presumption, the analysis under a microscope has led to these conclusions:

- The surface of the retouched notches was polished (Fig. 112), therefore it could have either had a contact with some soft material or had an impact of post depositional processes (rubbing in the sand).
- Both ends and non-retouched edges of the artefact have some weak traces of utilization or friction to some other material. This feature was most probably the result of the conditions of preservation.

[384] Bordaz, J., 1970, Tools of the Old and New Stone Age, New York, 146 p.

[385] Berthelsen, W., 1944, Stenalderbopladser i Sønderkær og Vejledalen: Bidrag til Kendskabet til den mesolitiske Kulturperiode i Sydøstjylland, København, 135 p.

The presumption of the possible artifacts' contact with a soft material might lead to a few different conclusions:

1) either this find was a fragment of a more elaborate artefact combined with some leather or other soft material details that did not preserve;
2) or it was used to work on some soft material, e. g. leather.

The latter conclusion would approve the theory that notches were made for scraping activity. However, the interpretation that this find could have been a figurine cannot be neglected too. Thus, even if there is a probability that the blade from Skaruliai is a piece of portable art instead of it being a tool, the chronological aspect which was already described before suggests a conclusion, that it is not a remain of the earliest Palaeolithic art piece in the lower reaches of the river Neris. In addition, an artefact with some retouched notches on sides was also found in Skaruliai 2 site 1,5 km away (see section *'Skaruliai 2 site'*). Therefore a direct relation between the sites might be considered.

Another presumed flint 'figurine' was discovered at Vilnius 1 site (Fig. 106:3) and was already compared with the artefact from Skaruliai 1 site[386]. The distance between these two sites is 75 km in a straight line or 120 km if going along the river valley.

From the aesthetic perspective the retouched artefact from Vilnius 1 site would remind of an anthropomorphous figure. Most probably the marginal retouch was applied to form the artefact in a particular way, the blade which was originally nearly 3 cm wide was narrowed by 0,6–1,0 cm on both sides. To add, it seems that the maximum width was wanted to be kept, as no retouching was evident on the outermost points of the left and right sides. It could only be presumed that the blank used for making this thing could have been longer than 10 cm. However, the analysis of the utilization marks visible on the margins of this artefact has shown that the distal left margin was used for some work similar to scraping. Moreover, it was used after the artefact was broken. Thus, if the original function of the find was related to aesthetic or sacral

[386] Rimantienė, R., 1984, Akmens amžius Lietuvoje, Vilnius, p. 56.

purposes, then later some other people might have used it as a tool for some usual work.

On the basis of the contextual archaeological data of Vilnius 1 site it could be presumed that the 'figurine' could be dated to Final Palaeolithic. However, the missing distal and proximal ends make it difficult to interpret. The relation between Skaruliai 1 notched blade and the artefact found at Vilnius 1 site could only be considered reservedly as the two finds might be of different chronology.

The last artefact which might be discussed as a possibly significant portable thing – a piece of pine resin, converted to amber-like specimen – was found in Pasieniai 1 site (Fig. 150:4). As E. Šatavičius has noticed, from one perspective the form of this piece could remind of a swan[387], yet most probably it was not formed in any way. The specimen did stand out due to its yellow shining color and a soft surface. It was discovered within the limits of a prehistoric site, thus, it could have been important for Stone Age people. Assumedly, it might have been brought as a talisman to the site from somewhere beyond the limits of the campsite, or could have been exchanged/ be given as a present. The amber piece should most probably not be interpreted as a piece of art, even if it could have had an aesthetic significance. Instead, it might be a remnant of resin material extracted from pines and used for tool making or other purposes (e.g. for glueing).

The misidentification of portable art artefacts is only one of the well known problems in the studies of prehistoric European art discovered up until today[388]. However, despite the artefacts from Eiguliai 1A and Pasieniai 1 that were not interpreted as pieces of portable art, the finds from Vilnius 1 and Skaruliai 1 sites do not confirm nor deny the latest theories considering the Northeastern Europe Final Palaeolithic people's ability to create art[389]: it cannot be stated that communities of Late Glacial and Early Holocene had no

[387] Šatavičius, E., 2012, Pasieniai 1 settlement / In: Archaeological Investigations in Independent Lithuania, Vilnius, p. 25.

[388] Bednarik, R. G., 1996, Crisis in Palaeolithic art studies / In: Anthropologie, Vol. 34 (1), p. 123–130.

[389] Kowalski, K., Płonka, T., 2011, New ornamented artefacts from the Polish Lowland and Final Palaeolithic Symbolism / In: Humans, environment and chronology of the Late Glacial of the north European Plain, p. 179–185.

portable art traditions and aesthetic feeling. Due to their mobile way of living it could have been lost on the move instead of being left in an abandoned campsites, whilst the pieces made of organic material could have simply not preserved well.

9.2 Rituals

Up until today no ritual activity dating to earlier times than Middle Mesolithic was identified in Lithuanian territory. However, the sacred traditions practised here in Mesolithic[390] were similar to those of the Northern Europe and had some common features: inhumation burials, symbolic use of ochre, burial gifts related to animal parts (teeth, wings, etc.), a special positioning of the things in the ritual places[391].

In the investigation of the Final Palaeolithic–Early Mesolithic sites in the western part of the river Neris basin, only one case of a presumably ritual activity might be taken into discussion. That was a feature No. 2 and its attributes unearthed in Pabartoniai 1 site.

As it was already described before (see section *'Pabartoniai 1 site'*), the feature No. 2 was a burnt prehistoric object of greyish color, which appeared in the lowest stratigraphic layer, when the archaeological finds horizon was going to an end. Unearthed in the white fine grained sand the feature had a not clearly defined form and in the centre had some sediment mixed with red ochre (also a little piece of ochre was found). As it went deeper, only one arcaheological artefact was discovered in the centre of a most intensively colored stain – an unburnt and unbroken point of a Late Swiderian type. The feature itself contained sediment mixed with ashes and small charcoal pieces. According to Dr H. Kroll (Kiel university), the archaeobotany remains full of *Pinus sylvestris* charcoal pieces have shown that the fire that had an impact on the wood in this object was probably controlled by human being as the pieces of charcoal were very tiny and had burnt very fine. Therefore this feature was interpreted as a

[390] Butrimas, A., 2012, Donkalnio ir Spigino mezolito-neolito kapinynai: seniausi laidojimo paminklai Lietuvoje, Vilnius, 256 p.

[391] Zagorskis, F., 1987, Zvejnieku akmens laikmeta kapulauks, Rīga, 130 p.
Larsson, L., 2004, The Mesolithic period in Southern Scandinavia: with special reference to burials and cemeteries / In: Mesolithic Scotland and its Neighbours (ed. A Saville), Society of Antiquaries of Scotland, Edinburg, p. 371–392.

fireplace.

Comparing with the surrounding find horizon level, the feature No. 2 was recessed at least 50 cm deeper into the ground. Whilst the bottom sediment and the periphery of the object was not burnt (had no orange/red coloring and stiffness), therefore if it was a fireplace, the temperature reached in it was not very high. Presumably the fireplace was used not for many times, maybe only once.

The outstanding attribute was that the flint artefact – a point – found in the fireplace was unburnt and probably was left by prehistoric people as a full unbroken and still usable arrow, though its organic details did not remain through time in a sandy environment. The shift of this find caused by bioturbations could be rejected due to several reasons:

a) No other flint finds were bioturbated into the feature No. 2, nor they were found in the same level around it;
b) A fireplace yielding a point instead of any other type of find (a flake, piece of a core, blade fragment, or else) was too perfect to be a coincidence;
c) There were only several points (all fragmented) found in the trench of 100 m^2, thus these kind of artefacts were rare in Pabartoniai 1 site (approximately 1 out of 1000 finds).

Having in consideration the rejected post-depositional movement of the point the operational sequence of this artefact getting into the fireplace would become interesting and unusual: as it was not affected by fire, it should have been put in the fireplace only after it was used for burning wood and cooled down afterwards. Moreover, the fireplace was not used after the point got into (or was put into) it.

However, a chronological aspect makes the interpretation of this archaeological object complicated. A charcoal fragment taken from the feature No. 2 was dated to 6659 – 6475 cal BC. The dating does not match with the widely accepted dating of Late Swiderian culture that is believed to be at least

one thousand years earlier[392]. The dating could be incorrect as the sample could have been contaminated. In this case usually the repeatedly dated samples from the same feature prove the dating to be earlier rather than later[393]. The dating of the fireplace was also questionable because it did not relate to any other AMS ^{14}C dated feature in Pabartoniai 1 site – it is at least five hundred years later than other objects found in the site (though not all of them were investigated). Basically three stages of site settling in Mesolithic were defined in the site (see section *'Pabartoniai 1 site'* and Table 5). Thus, a presumption can be made that the fireplace could be dated to a bit earlier period, however, not as early as the Late Swiderian points are usually dated. Thus, most probably the point and the blade found in the context of feature No. 2 should be interpreted as related to the earliest horizon that was the least evident in all the archaeological data discovered in Pabartoniai.

However, if after some re-investigation of feature No. 2 dating an earlier dating was approved, a ritual-related interpretation on the function of it could be simulated as follows: a short-use fireplace could have been made by people in Pabartoniai 1 site during their short stay on the river Neris bank. The use of an arrow would implicate that the main purpose of their visit might have been hunting. Before leaving the site those people could had symbolically put an arrow into the cool fireplace and spill some ochre over it. That small ritual could have been done for the good luck in the future hunt.

If this assumption was ever proved, it could be considered as the first and only case of ritual activity related to Late Swiderian culture discovered in Lithuania. Whilst until the clarification of the feature No. 2 dating and function, the case should be interpreted reservedly.

9.3 River as a symbol

Despite all the physical characteristics numbered and analyzed before, it must be noted, that the main natural object of this study – the river – could have

[392] Šatavičius, E., 2001, Vėlyvojo paleolito kultūros ir jų likimas ankstyvajame mezolite / Doctoral dissertation, Vilnius University, Vilnius, Fig. 60.

[393] Personal consultation with John Meadows, 2016 September.

also had some symbolic meaning in the Final Palaeolithic–Early Mesolithic social environment. On the basis of some ethnographic data it might be presumed that the two biggest water bodies within the geographical limits of concern – the Neris and Šventoji rivers – should have played some role in the first inhabitants' understanding of the landscape that surrounded them. It could have been a connecting, yet also a dividing feature; a central unit of the landscape, which was wanted to be reached, and sometimes was a dangerous place where people had to behave carefully.

Probably the most common symbolic meaning of a river that is still relevant in present times, was seeing it as a territory dividing border which separates one side of the river from another. Those territories could have been regarded as social landscape units – two areas occupied by some different groups of people. From the orographic point of view, in some parts of the valley one of the banks of the Neris and Šventoji rivers was higher than the other, thus, from one side magnificent terraces were visible, whilst if looking from the opposite side, a wide plateau could be seen. This character of the valley could have sometimes strengthen the motion that the two sides of the river were 'different'. The social groups of people might even have been called by a reference to a river that was part of their site catchment. This manner of calling the other tribe as 'people from the other side of the river' was recorded within the Evenki people and elsewhere[394]. Many hydronims related to the names of the rivers also implicate that the river was important for peoples' understanding of their living place and its relation to the surrounding landscape in historic times, thus, presumably, in prehistoric period as well. To give an example, Nunamiut Eskimos call a part of the John River valley (Alaska) *Nachrankunga*, that would mean 'A dividing creek' (*nachrach* – 'divide', and *kook* – 'creek')[395]. Thus, it might be assumed that some rivers, especially the biggest ones, might have also divided the territory of this study concern into several site-catchments, as in

[394] International Conference 'Human-environment relations: memories, narratives and practices in Siberia and China', Vilnius University, Vilnius, May 1–2, 2015.

[395] Rausch, R. L., 1951, Notes on the Nunamiut Eskimo and Mammals of the Anaktuvuk Pass Region, Brooks Range, Alaska, Arctic Institute of north America.

Final Palaeolithic a stable settled way of life was not formed yet.

During the corporate hunts of migrating animals some places at the valley of a big river, as a place of action, could have been regarded as sacred. According to ethnographic data, such a hunt of Nunamiut Eskimo was always accompanied by some ritual activity: a shaman of the tribe used to sing by standing near the body of water, at the place where reindeers were supposed to approach. The songs were performed at the beginning of the hunt to attract the herd, and when the reindeers stepped into the water, to thank the animal spirits. In the case of unsuccessful hunt the particular place by the water body was regarded as not lucky or being posessed by negative powers, therefore it was not visited for hunting purposes in the several upcoming years[396]. The hunting sites on the banks of the river Neris, that were occupied for multiple times (see section *'Camping and living place selection'*), might implicate that those places were seen as bringing a big luck in the hunt, at least for several years or for some certain communities, as according to the ethnographic data, some aboriginal hunters have particular hunting places where 'a good working relationship' is established with the land[397].

The big river could have also had a symbolic meaning for hunters which might have been accepted as natural and usual, yet terrifying: during the hunt that took place in the body of water the hunter could have been injured and might have been very close to death. In addition, according to the ethnographic data, some aboriginal people cannot swim[398], and most of indigenous people in Siberia believe that in behalf of religious aspects, it is forbidden to save a drowning person, as it would irritate some aquatic spirits[399]. Thus, the river was also a potential place to die, and that must have been remembered everytime when heading to the river for slaughter.

Another case when a big river could have become a death-related place might have been the senicide action when the ill or injured, disabled members of

[396] Binford, L. H., 1991, A Corporate Caribou Hunt. Documenting the Archaeology of Past Lifeways / In: Expedition: The magazine of the University of Pennsylvania, Vol. 33, p. 33–43.

[397] Lee, R. B., Daly, R. (eds.), 2012, The Cambridge Encyclopedia of Hunters and Gatherers, p. 145.

[398] Zaliznyak, L., 1997, Mesolithic Forest Hunters in Ukrainian Polessye, BAR International Series, book 659, England, p. 72.

[399] Lee, R. B., Daly, R. (eds.), 2012, The Cambridge Encyclopedia of Hunters and Gatherers, p. 150.

the family could have been left by the river if they were not able to cross it when traveling. This behaviour was recorded in some communities of nomads in the 20th century. Also some of the stony rapids could have been very dangerous and should have been avoided due to the fact that there might have been former cases when some people had serious trouble trying to cross it.

After analyzing many different types of sites in the river Neris basin it was apparent that most of them were short-term camps and most probably were not considered as 'home' places, at least in the meaning used in present times. Instead, a big site-catchment area overwhelming many of those small campsites was regarded as 'home' or 'homeland' in prehistoric times. That sort of area might have been related to some water body, e.g. a particular river bank or one side of the river valley, just as it was recorded in some indigenous people living territories, e.g. Ainu or Khanty tribes[400]. It might be presumed that the territory of focus could have been also seen as 'home' territory, and the big rivers Šventoji and/or Neris might have been natural features that were understood as main symbols of the territory. Going somewhere to an unknown land could have meant heading towards some areas beyond the limits of Neris basin. In this case the river could have been a most significant geographic feature for some related groups of people or families.

10. THE DISAPPEARANCE OF THE FIRST INHABITANTS

From the taphonomic point of view, what was archaeologically recorded as the remains of the first settling epoch in the western part of the river Neris basin, were lithic artefacts and some very few features of the settlements. No archaeological data considering human remains or burials of any kind was ever discovered in the area of focus and the questions where and how the pioneers of this land had ended their lives, remained unanswered. The river Neris basin territory would probably not ever yield remains of the first very first explorers of

[400] Lee, R. B., Devore, I. (eds.), 1968, Man the Hunter. The first intensive survey of a single, crucial stage of human development – man's once universal hunting way of life, p. 71.
Zvelebil, M., 2003, People behind the lithics. Social life and social conditions of Mesolithic communities in temperate Europe / In: Peopling the Mesolithic in a northern environment (eds. Bevan, L., Moore, J.), Oxford, p. 6.

the land – groups of Brommean or Ahrensburgian culture people – for whom the valley of the river Neris was a peripheral land visited ephemerally rather than inhabited for a longer time. On contrary, the earliest human remains that archaeologists could maybe expect to find within the limits of this land would be of Swiderian people, as this territory might have comprised a big part of their site-catchment area. The bad preservation conditions in sandy sediments and the lack of excavations done in wetlands are probably the main reasons for not having such archaeological objects. Some Mesolithic human remains, however, were preserved in the surrounding areas[401], yet none of the burials were dated to as early period as would concern the chronology of this study. Thus, in general no burying-related traditions have been traced in the territory until the appearance of Kunda culture in the Eastern Baltic region. It has to be noted that the topic of where did the Final palaeolithic people bodies had disappeared was almost never discussed in the archaeological literature.

It could be assumed that from a demographic perspective the human population in Final Palaeolithic–Early Mesolithic was not large. There would be no reason to make statistical counting on the probable numbers of individuals who might have existed at one time in the area of focus, yet one thing could be told without a doubt – humans had shared one biome with many other species of animals, predators as well. Therefore presumably the taphonomy issue that concerns disappearance of dead human bodies which were not buried most likely was naturally the same as of other animals. Thus, the remains of the first inhabitants of the land might be not ever found. However, some exceptions could still be concerned. In the cases when some individuals had died in a body of water, e.g. drowned trying to cross it, a very small probability to find at least partly preserved remains of a skeleton exists. Yet non of the archaeological research strategies could possibly be applied to find these cases, and if there will ever be a chance to investigate the remains of the first settlers of the river Neris basin, it will probably be due to an accidental discovery.

[401] Butrimas, A., 2012, Donkalnio ir Spigino mezolito–neolito kapinynai. Seniausi laidojimo paminklai Lietuvoje, 256 p.
Larsson, L., Nilsson Stutz, L., Zagorska, I., Bērziņš, V., Ceriņa, A., 2017, New aspects of the Mesolithic–Neolithic cemeteries and settlement at Zvejnieki, Northern Latvia / In: Acta Archaeologica, Vol. 88, Iss. 1, p. 57–93.
Personal consultation with K. Duderis, 2018.

Whereas from the historical point of view the disappearance of the pioneers of the study area is a very complicated issue. The Late Swiderian culture transformation/disappearance/extinction from the river Neris basin was and still is related to the appearance of Kunda culture in Early Mesolithic. This topic was discussed for many times and a range of theories were proposed until today. However, as the issue was considered as worth an additional study, it will not be discussed within the limits of this research. Though some insights might be mentioned after analyzing all the flint assemblages from the sites discovered in the area of focus. They should not be seen as conclusions or final remarks, yet they might become important for further investigation of the Late Swiderian–Kunda culture relation and interaction issues:

a) it seems that the classical artefacts of Kunda/Pulli type were found only in the northern part of the area, therefore most likely the people who had the technical knowledge how to make those beautiful tools came from the north;
b) The lithic assemblages containing points made by Swiderian manner were much more common in the area of concern and their latest dating is still not determined. Archaeological data from Pabartoniai 1 site might implicate that the flat retouch on the ventral side of the point was applied a bit longer than it was thought before;
c) The Late Swiderian points made from more regular blades and with a tip retouched from the ventral side were previously regarded as Post-Swiderian, yet the term *Post-* should mean something that appeared *after* something was gone, and the main characteristic of Swiderians – retouching the ventral side of the blank – was not *gone*, it was still *in use*. Therefore Late Swiderian phase might be regarded as lasting up until these points were not produced anymore;
d) The flat retouching of the point tip and the use of unipolar cores could be seen as the two techniques that were admired and copied by Late Swiderians soon after they got into contact with Kunda culture people. It was something they might have wanted to learn, and the points that were

previously named as ‘Post-Swiderian’ could be seen as a not professional copies of Kunda/Pulli points;

e) The latest research done on the regular blade production technique development in the Northeastern Baltic region is about to reach the point when the northeastern origin of this manner of flint knapping will be finally proved;

f) The people who had come from the north (Kunda culture) somehow did not go further to the south, despite the fact that the southern territories were full of flint. Thus, a logical question then might be risen: why? Perhaps, one of the possible answers might be that somebody was living in the area and was not about to go away. These might have been the Late Swiderians who could have been still existing in the area of concern. Thus, for some time, and maybe for quite a long period of time these two cultures might have coexsisted, and Kunda culture was not ‘allowed’ to occupy the southern territories;

g) The main change might have happened not in the Final Palaeolithic–Early Mesolithic transition, but from the Early Mesolithic to Middle Mesolithic instead. The Late Swiderians should have vanished just before this transition. However, the reason why did it happen might be searched for in the long-term processes as assimilation, migration or else, yet some sudden events should be taken in consideration as well.

11. CONCLUSIONS

After analyzing the archaeological data obtained in a range of sites investigated in the western part of the river Neris basin and its correlation with widely accepted chronology of the Final Palaeolithic–Early Mesolithic archaeological cultures, the following concluding remarks could be given. Whereas the small discoveries such as fitting parts of tools found, revisioned functions of some implements, suggested new interpretations on individual artefacts, relocalized archaeological sites, etc. depicted in the study text will not be repeatedly listed here as they were too numerous.

The pioneers of the territory of concern most likely showed up at some point in the Younger Dryas, or in the Allerød at the earliest. These were some small groups of Brommean culture hunters, who had occupied several spots in the river Neris valley. This stage of the land 'discovery' should be seen as ephemeral. Most probably the so called Brommean people regarded this territory as the northernmost that was worth visiting due to the clear distinction between non-flinty and flinty areas, the latter of which was prefered.

The second stage of the territory settling happened after some time, maybe in the very end of the Younger Dryas, when some valleys of the rivers were occupied by inhabitants who have used Early Swiderian type of arrows for hunting. The sites yielding such an inventory were very few and they were situated relatively close to the border of flinty area, thus it could also be presumed that these groups of people valuated the river Neris valley for hunting perspectives, yet after short visits paid in the area of concern most probably turned backwards to the south. This stage of settling should also be rather seen as episodic, without further exploration of northern lands. Only several points along the river Neris were inhabited for some longer period of time. It might be presumed that these people were confident enough with the environment they had been living in and the river Neris basin could have been the northern point of their site-catchment area.

The second stage of territory visiting could be also related to some Ahrensburgian groups of people, which could have appeared in these lands approximately at the same time as Early Swiderians and behaved just in the same manner: they have reached some spots a few dozen kilometres further than the border of the flinty area, and then most probably turned backwards. At some sites they were the pioneers, whilst several places might be regarded as revisited after their predecessors (Brommean people) had been there first. The Ahrensburgian hunters might have been in some contact with Early Swiderians, yet this process could not be proved by any other arguments than the fact that some flint artefacts characteristic to both archaeological cultures were sometimes found at the same placement.

The previously depicted stages of the territory settling could be ascribed to the so called 'pioneer phase'[402] when the land was explored seasonally and temporarily. Presumably it might have lasted up until the middle of the Younger Dryas period.

The next phase of the territory settling is related to the Late Swiderians who appeared in the territory in the very end of the Younger Dryas or in Early Preboreal. Several Ahrensburgian groups might have still been present in the area also. In addition, some of their technological patterns might have been adapted in Swiderian culture through time. Some hunting spots as well as the same sources of flint might have been shared. In this stage the western part of the river Neris was passed for many times, thus it was much more explored. For some people groups the area of focus might have become their territory of site-catchment. Whereas people who have considered the southern part of current Lithuanian territory as their 'homeland' could have seen the river Neris basin as a peripheral land (for some people these 'limits' could have reached Daugava river valley in Latvia). There should have been already some information about it circulating among the Final Palaeolithic communities that lived in a distance of a few hundred kilometers to the south.

[402] Gamble, C., Davies, S. W. G., Richards, M., Pettitt, P., Hazelwood, L., 2005, Archaeological and genetic foundations of the European population during the Lateglacial: Implications for 'agricultural thinking' / In: Cambridge Archaeological Journal, Vol. 15, p. 55–85.

Most likely the Late Swiderians were the first communities who have not only made journeys to the territory of concern, but were well equiped and determined to go further north from the flinty areas. The net of bodies of water was then explored and quite intensively exploited for fishing, food gathering and hunting up to Preboreal period. Hunting sites were of various types – large, shared among some groups of hunters, as well as small ones, settled for some occasional hunts. In this stage people started to be well acquainted to the landscape of the western part of the river Neris basin. On the basis of the earliest radiocarbon datings in the area of concern obtained during this study from Dūkšteliai 1 site, it became apparent that in Preboreal the shores of previously existed lakes were already inhabited. This data correspond to the Late Swiderian period, however, the missing part of the flint assemblage at the site did not allow to determine the archaeological culture.

In the period described above the flint material transportation to the area have quickened, the system of exchange might have been formed already. This character of active development of the flint exchange system in the territory of focus can be regarded as a feature common to Swiderians in particular and correspond with the same ways of maintaining the raw material dispersion in Swiderian period recorded in Poland[403]. Whereas the area in focus might be regarded as a 'corridor' which connected flinty areas in the Southern Lithuania with Daugava river valley – the northernmost area inhabited by Late Swiderians.

Along with the flint knapping technology, the knowledge about the land was passed on to the descendants – the last Swiderians of Early Mesolithic, who have been experiencing the landscape in the same way as Final Palaeolithic predecessors: a rather nomadic settling of various places around their wide site-catchment area.

At some point, probably in the middle or the end of Preboreal, the river Neris basin was also visited by people who had most likely came from the north–northeast – they knew Kunda/Pulli technique of flint tool production. In

[403] Kozłowski, J. K., Kozłowski, S., 1996, Le Paléolithique en Pologne, Collection L'Homme des Origines, No. 2, Série 'Préhistoire d'Europe', p. 94.

the shared social and physical environment some ideas were most probably exchanged, as some of the people who were used to Swiderian traditions of tool making started to use a regular blade production technology and applied flat retouch on the ventral side of the point tip more often. These assumptions would correspond with the lately discussed hypotheses of the regular blade production technology spread from northeast to southwest (and northwest)[404]. In some cases the Late Swiderian/Kunda people were not the pioneers of the land, but were re-settlers of the places that have been occupied by their predecessors.

On the basis of the AMS ^{14}C dates obtained in the recently excavated sites within the study area it might be presumed that this stage of the area settling could have lasted up until around 7900–7800 cal BC, the beginning of the Boreal period. This relatively late dating of the last Swiderians in the territory should be proven or denied in the future investigation, yet nearly the same ending of the so called *Post-Swiderian* epoch was presumed in some of the former archaeological studies[405].

The first part of Boreal period should be regarded as the ending of the settling of the western part of the river Neris basin epoch that presumedly lasted around 3 500 years. Throughout this epoch people who can be ascribed to at least five different archaeological cultures or their branches have visited the area of focus. As the landscape of the study area was more or less homogeneous and had no natural features that would significantly stand out, people of different periods in Final Palaeolithic and Early Mesolithic chose characteristically the same places to settle, and no particular preferences among the cultural groups were noticed. Most probably the criteria for site placement selection were applied on the basis of the purpose of settling and had nothing to do with the manners of tool production. Yet in some cases it seems quite likely that the newcomers at some sites knew they were camping

[404] Sørensen, M., Rankama, T., Kankaanpää, J., Knutsson, K., Knutsson, H., Melvold, S., Eriksen, B. V., Glørstad, H., 2013, The First Eastern Migrations of People and Knowledge into Scandinavia: Evidence from Studies of Mesolithic Technology, 9th-8th Millennium BC / In: Norwegian Archaeological Review, p. 1–37.

[405] Kozłowski, S. K., 1989, Mesolithic in Poland. A New Approach, Warsaw, p. 166.

at the same place after the other people did. However, the level of dependence on flint sources might have differed among various groups of people, and might have had an impact on the northern limits of their site-catchment.

Due to the saved 'old-fashioned' manners of flint knapping – long blade production technology – the Early Mesolithic people needed a high quality flint material. Therefore it might be presumed that the flint transportation system (the direction of the paths, transportation ways and exploitation centres) once established in the end of Younger Dryas–beginning of Preboreal could have still existed more or less the same and was significant.

In general, no big differences between the Final Palaeolithic and Early Mesolithic way of living and exploitation of the territory of concern were determined. Therefore the latter period should be regarded as a direct continuation of the sustained manners and traditions. The Early Mesolithic inhabitants of the area have also had a big impact for flint material scattering in various places in the river Neris basin. In this way a 'net of flint debitage exploitation points' was created, which was later used by Neolithic communities. People's behavioural pattern of leaving quite large amounts of flint debitage in their sites in the period of question most probably have resulted in that the same spots were visited for multiple times in the future. The negative aspect about this was that on contrary to Mesolithic people who had still kept sourcing for high quality flint material, some Neolithic sedentary communities might have seen the Final Palaeolithic–Early Mesolithic sites all around the area as convenient flint exploitation spots and did not depend on the flint transportation system. In this way, the landscape 'map' and understanding of the site catchment in Neolithic–Bronze Age might have become completely different from the one which was experienced by the first inhabitants of the land.

Presumably due to the reasons listed above a lot of the earliest sites were mainly disturbed in the end of the Stone Age and could be barely recorded today. Some potential places might still be located within the study area, and the previously discovered sites can still be excavated, yet a big part of the river

valleys was affected by urbanization processes and sand/gravel mining. Nevertheless, a further investigation of the western part or the river Neris is still possible and perspective. Whilst the established database of the first 25 AMS ^{14}C datings from the study area done during this research may become a starting point in the upcoming formulation of the Eastern-Central Lithuania settlement chronology.

The surface collections from the well known sites in the area of focus are proposed to be revisioned and evaluated through a technological perspective in order to bring them back into scientific discussion. The use of crested blades, decortication flakes and other patterns are suggested to be analyzed with an aim to tell more about the first settlers' behavior, the site occupation duration and raw material accessibility.

After analyzing all the cases and individual artefacts that could have been presumably ascribed to some symbolic, magic, art-related and similar activity, it was apparent that almost no archaeological material was found in the western part of the river Neris basin which could undeniably support the hypotheses that Final Palaeolithic people had some portable art, ritual or other traditions of similar kind. However, the lack of evidence does not definitely mean that these things did not exist. Perhaps in the future research, especially after investigation of some wetlands, some art- or ritual-related artefacts made of organic material could be discovered.

BIBLIOGRAPHY

Literature

Andersson, M., Cronberg, C., 2007, Moving north – The first travellers to South Scandinavia / In: On the road. Stodies in honour of Lars Larsson, Acta Archaeologica Lundensia, Vol. 4, No. 26, p. 143–148.

Baales, M., Grimm, S., Jöris, O., 2001, Hunters of the 'Golden Mile': The late Allerød Federmessergruppen Site at Bad Breisig, Central Rhineland, Germany / In: Notae Praehistoricae, p. 67–72.

Balčiūnas, J., Dakanis, B., Zabiela, G., 1988, Vilniaus miesto ir rajono archeologijos paminklų žvalgymas 1987 m. / In: Archeologiniai tyrinėjimai Lietuvoje 1986 ir 1987 metais, Vilnius, p. 177–178.

Baltramiejūnaitė, D., Vengalis, R., 2010, Tyrinėjimai Semeniškėse / In: Archeologiniai tyrinėjimai Lietuvoje 2009 metais, Vilnius, p. 98–105.

Baltrūnas, V., Barzdžiuvienė, V., Blažauskas, N., Dvareckas, V., Gaigalas, A., Grigienė, A., Juodagalvis, V., Kabailienė, M., Karmaza, B., Kisielienė, D., Melešytė, M., Ostrauskas, T., Pukelytė, V., Rimantienė, R., Stančikaitė, M., Šeirienė, V., Šinkūnas, P., Ūsaitytė, D., 2001, Akmens amžius Pietų Lietuvoje (geologijos, paleogeografijos ir archeologijos duomenimis), Vilnius, 260 p.

Baltrūnas, V., Karmaza, B., Kulbickas, D., Ostrauskas, T., 2007, Egzotinė titnago bei titnago pakaitalų žaliava Lietuvos akmens ir žalvario amžiaus gyvenvietėse / In: Lietuvos archeologija, Vol. 31, Vilnius, p. 109–122.

Basalykas, A., 1965, Lietuvos TSR fizinė geografija, Lietuvos TSR Mokslų akademija, Vol. 2, Vilnius.

de Beaune, S. A., 2000, Pour une Archéologie du geste, Paris, planche VII.

Bednarik, R. G., 1996, Crisis in Palaeolithic art studies / In: Anthropologie, Vol. 34 (1), p. 123–130.

Benecke, N., 2004, Faunal succession in the lowlands of northern Central Europe at the Pleistocene – Holocene transition / In: Hunters in a changing world. Environment and Archaeology of the Pleistocene – Holocene Transition (ca. 11000-9000 B.C.) in Northern Central Europe (eds. Terberger, T., Eriksen, B. V.), Internationale Archäologie – Arbeitsgemeinschaft, Tagung, Symposium, Kongress 5, p. 43–51.

Berthelsen, W., 1944, Stenalderbopladser i Sønderkær og Vejledalen: Bidrag til Kendskabet til den mesolitiske Kulturperiode i Sydøstjylland, København, 135 p.

Binford, L. H., 1991, A Corporate Caribou Hunt. Documenting the Archaeology of Past Lifeways / In: Expedition: The magazine of the University of Pennsylvania, Vol. 33, p. 33–43.

Binford, L. R., 1978, Nunamiut Ethnoarchaeology, Studies in Archaeology, New York, Academic Press, 509 p.

Bitner-Wróblewska, A., Banytė-Rowell, R. (eds.), 2016, Inwentarz archeologiczny guberni kowieńskiej Michała Eustachego Brensztejna, Aestiorum Hereditas III, Part 1, Warszawa, 480 p.

Bockstoce, J. R., 1977, Eskimos of Northwest Alaska in the Early Nineteenth Century, ed. T. K. Penniman, University of Oxford, Pitt Rivers Museum, England, 139 p.

Bordaz, J., 1970, Tools of the Old and New Stone Age, New York, 146 p.

Boroń, T., Królik, H., Kovalski, T., 2011, Antropomorficzna plastyka figuralna krzemienna i kościana w społecznościach pradziejowych z ziem Poskich / In: Archeologia Polski, Vol. 56, p. 65–88.

Bouvry, F., 2008, Une anthropologie des manifestations esthétiques du Mésolithique européen de la fin du Tardiglaciaire et durant le Postglaciaire, 643 p.

Brazaitis, Dž., 1998, Žvalgomieji tyrinėjimai Kunigiškių akmens amžiaus gyvenvietėse / In: Archeologiniai tyrinėjimai Lietuvoje 1996 ir 1997 metais, Vilnius, p. 4–7.

Brazaitis, Dž., 1999, Dvaro kaimo (Vilniaus r.) akmens amžiaus radimvietės / In: Lietuvos archeologija, Vol. 16, Vilnius, p. 281–309.

Brazaitis, Dž., 2004, Papiškių 4-oji durpyninė gyvenvietė / In: Lietuvos archeologija, Vol. 25, p. 187–220.

Brazaitis, Dž., 2008, Žvalgomieji tyrinėjimai Pasienių akmens amžiaus gyvenvietės aplinkoje / In: Archeologiniai tyrinėjimai Lietuvoje 2007 metais, Vilnius, p. 28–31.

Breuil, H. A., 1974, 400 siècles d'Art Pariétal. Les cavernes ornées de l'age du renne, Paris, 412 p.

Brézillon, M. N., 1968, La dénomination des objets de pierre taillée: matériaux pour un vocabulaire des préhistoriens de langue française / In: IV^{e} supplément à Gallia préhistoire, Paris, 416 p.

Burdukiewicz, J. M., 1987, Late Palaeolithic Settlements in the Kopanica Valley / In: Late Glacial in Central Europe: Culture and Environment, p. 183–213.

Butrimas, A., Ostrauskas, T., 1999, Tanged point cultures in Lithuania / In: Tanged points cultures in Europe (eds. Kozłowski, S. K., Gurba, J., Zaliznyak, L. L.), Vol. 13, Lublin, p. 267–271.

Butrimas, A., 2012, Donkalnio ir Spigino mezolito-neolito kapinynai: seniausi laidojimo paminklai Lietuvoje, Vilnius, 256 p.

Cappers, R. T. J., Bekker, R. M., Jans, J. E. A., 2012, Digitale Zadenatlas van Nederland. Digital seed atlas of the Netherlands, 2nd edition, Groningen, 502 p.

Dr. Capitan, 1922, La Préhistoire, Collection payot, Planche VI, Paris, 157 p.

Chaix, L., 2009, Mesolithic elk (Alces alces L.) from Zamostje 2 (Russia) / In: Mesolithic Horizons. Papers Presented at the Seventh International Conference on the Mesolithic in Europe, Belfast 2005 (*eds*. McCartan, S. B., Schulting, R., Warren, G., Woodman, P.), Vol. 1, p. 190–197.

Clark, J. G. D., 1936 (2014), The Mesolithic Settlement of Northern Europe, 318 p.

Clarke, A., Vila, A., Estevez, J., Hardy, K., 2012, The Tie That Binds? An incised Mesolithic bevelled pebble from Camas Daraich, Skye / In: Mesolithic Miscellany, Vol. 22, No. 1, p. 3–9.

Cook, J., 2013, Ice Age Art: The arrival of the modern mind, The British Museum press, 288 p.

Couchaux, D., 1980, Habitats nomades, Paris, 160 p.

Daugnora, L., 2004, Mamutai Lietuvoje / In: Lietuvos archeologija, Vol. 25, Vilnius, p. 9–16.

Daugnora, L., Girininkas, A., 2004, Rytų Pabaltijo bendruomenių gyvensena XI–II tūkst. pr. Kr., Vilnius, 304 p.

Daugnora, L., Girininkas, A., 2005, Šiaurės elnių keliai ir jų paplitimas Lietuvoje vėlyvajame paleolite / In: Lietuvos archeologija, Vol. 29, Vilnius, p. 119–132.

Djindjian, F., 2009, Le concept de territoires pour les chasseur cueilleurs du paléolithique supérieur européen / In: Le concept de territoires dans le Paléolithique supérieur européen (*eds*. Djindjian, F., Kozlowski, J., Bicho, N.), BAR International Series, book 1938, Proceedings of the XV World Congress (Lisbon, 4-9 September, 2006), p. 3–26.

Dürre, W., 1971, Fundplätze der Ahrensburger Kultur im Kreise Soltau / In: Material hefte zur Ur-und Frühgeschichte Niedersachsens, Heft 4, 100 p.

Enloe, J. G., David, F., 1997, Rangifer Herd Behavior: Seasonality of Hunting in the Magdalenian of the Paris Basin / In: Caribou and Reindeer Hunters of the Northern Hemisphere (*eds*. Jackson, L. J., Thacker, P. T.), Chapter 4, p. 52–65.

Eriksen, B. V., 1990, Cultural Change or Stability in Prehistoric Hunger-Gatherer Societies. A Case Study from the Late Palaeolithic – Early Mesolithic in Southwestern Germany / In: Contributions to the Mesolithic in Europe (eds. Vermeersch, P. M., Perr, P. V.), p. 199.

Eriksen, B. V., 2002, Reconsidering the geochronological framework of Lateglacial hunter–gatherer colonization of southern Scandinavia / In: p. 25–41.

Fiedorczuk, J., Bratlund, B., Kolstrup, E., Schild, R., 2007, Late Magdalenian feminine flint plaquettes from Poland / In: Antiquity, 81, p. 97–105.

Fiedorczuk, J., Schild, R., 2002, Wilczyce – a new Late Magdalenian site in Poland / In: Recent studies in the Final Palaeolithic of the European Plain, Proceedings of a UISSP Symposium, 1999, Vol. 39, p. 91–100.

Gaigalas, A., Rimantienė, R., 2001, Medžiojamoji fauna akmens amžiuje / In: Akmens amžius Pietų Lietuvoje (*ed.* Baltrūnas, V.), Vilnius, p. 213–217.

Galimova, M., 2006, Final Palaeolithic–Early Mesolithic Cultures With Trapezia in the Volga and Dnieper Basins: the Question of Origin / In: Archaeologia Baltica, Vol. 7, p. 138, Fig. 2.

Galiński, T., Sulgostowska, Z., 2010, Younger Dryas Tanged Point Key Sites in Western Pomerania / In: Archaeologia Baltica, Klaipėda, Vol. 13, Fig. 4:4.

Gamble, C., Davies, S. W. G., Richards, M., Pettitt, P., Hazelwood, L., 2005, Archaeological and genetic foundations of the European population during the Lateglacial: Implications for 'agricultural thinking' / In: Cambridge Archaeological Journal, Vol. 15, p. 55–85.

Gedminienė, L., Gudaitienė, G., Zinkutė, R., Taraškevičius, R., Stančikaitė, M., 2015, Anthropogenic Impact or Natural Environmental Change: New Data Based on Palaeobotanical and Geochemical Analysis of Dūkštelis Lake Sediments / poster presentation in: INQUA Peribaltic Meeting, Netherlands, November 2–8.

Gedminienė, L., Rimkutė, G., Stančikaitė, M., 2014, Post-Glacial Environmental Changes and the Earliest Human Inhabitance of the Lake Dūkštelis Area, Eastern Lithuania / poster presentation in: Late Quaternary terrestrial process, sediments and history: from glacial to postglacial environments, Latvia, August 17–22.

Gehlen, B., 2012, Grundformproduktion und –verwendung im späten Mesolithikum Mitteleuropas / In: Steinartefakte: Vom Altpaläolithikum bis in die Neuzeit, Tübingen, p. 553, Abb. 4:A-B.

Girininkas, A., 1978, Šiaurės rytų Lietuvos akmens amžiaus paminklai (2. Jaros II vidurinio neolito (III tūkstantmetis prieš m. e.) gyvenvietė) / In: Lietuvos TSR Mokslų akademijos darbai, A, Vol. 3 (64), p. 63–72.

Girininkas, A., 1980, Naujos akmens amžiaus gyvenvietės Rytų Lietuvoje / In: Archeologiniai tyrinėjimai Lietuvoje 1978-1979 metais, Vilnius, p. 13–16.

Girininkas, A., 1998, Nauji archeologijos paminklai Kaišiadorių rajone / In: Archeologiniai tyrinėjimai Lietuvoje 1996 ir 1997 metais, Vilnius, p. 450.

Girininkas, A., 2009, Lietuvos archeologija: Akmens amžius, Vol. 1, Vilnius, 328 p.

Girininkas, A., *et al*., 2016, Lyngby type artefacts of Lithuania in the context of the Stone Age in Europe: multidisciplinary study / In: Archeologija un etnogrāfija, Riga, Vol. 29, p. 13–30.

Girininkas, A., Rimkus, T., Slah, G., Daugnora, L., 2017, Liungbiu tipo dirbiniai Lietuvoje / In: Istorija, Vilnius, Vol. 105, No. 1, p. 4–23.

Gob, A., 1990, Chronologie du Mésolithique en Europe. Atlas des dates ^{14}C / Histoire de l'art et archeology, Université de Liège, Faculté de philosophie et lettres, 290 p.

Graziosi, P., 1960, Palaeolithic Art, 290 p.

Grøn, O., 2005, A Siberian perspective on the north European Hamburgian Culture: a study in applied hunter-gatherer ethnoarchaeology / In: Before Farming, Vol. 1, p. 35–64.

Grøn, O., Kuznetsov, O. V., 2004, What is a Hunter-Gatherers Settlement? An Ethno-archaeological and interdisciplinary approach / In: Le Mesolithique / The Mesolithic, Section 7.1: Landscape-Use During the Final-Palaeolithic and Mesolithic in NW-Europe: The Formation of Extensive Sites and Site-Complexes, BAR International Series 1302, p. 47–53.

Grøn, O., Klokkernes, T., Turov, M. G., 2009, Cultural small-scale variations in a hunter-gatherer society: or 'everybody wants to be a little bit different!' An ethnoarchaeological study from Siberia / In: Mesolithic Horizons. Papers Presented at the Seventh International Conference on the Mesolithic in Europe, Belfast 2005 (*eds.* McCartan, S. B., Schulting, R., Warren, G., Woodman, P.), p. 203–209.

Gubser, N., 1965, Nunamiut Eskimos. Hunters of Caribou, London, New Haven, 384 p.

Gudaitienė, G., 2015, Dūkštelių akmens amžiaus gyvenvietė 1 / In: Archeologiniai tyrinėjimai Lietuvoje 2014 metais, Vilnius, p. 28–32.

Gudaitienė, G., 2015, Pabartonių akmens amžiaus gyvenvietė / In: Archeologiniai tyrinėjimai Lietuvoje 2014 metais, Vilnius, p. 32–38.

Gudaitienė, G., 2016, Archeologinis paveldas Pabartoniuose: rasti keliskart atrastą (part I) / In: Taurosta, No. 1 (2), Kaišiadorys, p. 118–122.

Gudaitienė, G., 2016, Dūkštelių senovės gyvenvietė / In: Archeologiniai tyrinėjimai Lietuvoje 2015 metais, Vilnius, p. 22–26.

Gudaitienė, G., 2016, Pabartonių akmens amžiaus gyvenvietės I ir II / In: Archeologiniai tyrinėjimai Lietuvoje 2015 metais, Vilnius, p. 26–31.

Gudaitienė, G., 2016, Rediscovering the Final Palaeolithic–Mesolithic at Pabartoniai, a site on the River Neris / In: Archaeologia Lituana, Vol. 17, Vilnius, p. 35–56.

Gudaitienė, G., 2017, Dūkštelių senovės gyvenvietė / In: Archeologiniai tyrinėjimai Lietuvoje 2016 metais, Vilnius, p. 24–26.

Gudaitienė, G., 2017, Pabartonių akmens amžiaus gyvenvietė I / In: Archeologiniai tyrinėjimai Lietuvoje 2016 metais, Vilnius, p. 26–31.

Guobytė, R., Rimkutė, G., 2013, Aerofotonuotraukų stereoskopinės analizės panaudojimas archeologiniuose tyrimuose / In: Metodai Lietuvos archeologijoje. Mokslas ir technologijos Lietuvos praeičiai pažinti (*ed*. A. Merkevičius), p. 606–617.

Heard, D. C., 1997, Causes of Barren-ground Caribou Migrations and Implications to Hunters / In: Caribou and Reindeer Hunters of the Northern Hemisphere (*eds*. Jackson, L. J., Thacker, P. T.), Chapter 2, p. 27–31.

Henry, A., Théry-Parisot, I, Voronkova, E., 2009, La gestion du bois de feu en forêt boréale: archéo-anthracologie et ethnographie (region de l'Amour, Sibérie) / In: Gestion des combustibles au paléolithique et au mésolithique. Nouveaux outils, nouvelles interpretations (*eds.* Théry-Parisot, I., Costamagno, S., Henry, A.), BAR International Series, book 1914, Proceedings of the XV World Congress (Lisbon, 4-9 September 2006), p. 17–37.

Ivanovaitė, L., Riede, F., 2018, The Final Palaeolithic Hunter-Gatherer Colonisation of Lithuania in Light of Recent Palaeoenvironmental Research / In: Open Quaternary, No. 4:4, p. 1–21.

Jablonskytė-Rimantienė, R., 1956, Pirminė kultūra Lietuvoje (Ekspozicijos vadovas) / In: Kauno Valst. M. K. Čiurlionio vardo dailės muziejaus leidinys, Kaunas, p. 7.

Jablonskytė-Rimantienė, R., 1965, Radikių akmens amžiaus stovyklos / In: Lietuvos TSR Mokslų akademijos darbai, A, Vol. 1 (18), Vilnius, p. 35.

Jablonskytė-Rimantienė, R., 1966, Paleolitinės titnago dirbtuvės Ežerynų kaime (Alytaus rajonas, Raitininkų apyl.) / In: Lietuvos TSR Mokslų akademijos darbai, Serie A, Vol. 2 (21), Vilnius, p. 87–100.

Jablonskytė–Rimantienė, R., 1964, Kai kurie Lietuvos pelolito klausimai / In: Lietuvos TSR Mokslų akademijos darbai, Serie A, Vol. 1 (16), Vilnius, p. 35–37.

Jablonskytė, R., 1941, Akmens amžiaus stovykla Skaruliuose (Jonavos vls., Kauno apskr.), Vytauto Didžiojo kultūros muziejaus metraštis, Vol. 1, Kaunas, p. 1–18.

Jackson, L. J., Thacker, P. T. (ed.), 1997, Caribou and Reindeer Hunters of the Northern Hemisphere, Avebury, 258 p.

Janevic, A., 1999, Das Swiderien der Krim / In: Tanged points cultures in Europe (*eds*. Kozłowski, S. K., Gurba, J., Zaliznyak, L. L.), Vol. 13, Lublin, p. 36–46.

Jochim, M. A., 1976, Hunter–Gatherer Subsistence and Settlement. A Predictive Model, New York, San Francisco, London, 223 p.

Juodagalvis, V., 2008, Mezolitas / In: Lietuvos istorija (*ed.* A. Girininkas), Vol. 1, Vilnius, p. 49–101.

Kabailienė, M., 2006, Gamtinės aplinkos raida Lietuvoje per 14 000 metų, Vilnius, 471 p.

Kabailienė, M., 1990, Lietuvos holocenas, Vilnius, 175 p.

Kabailienė, M., 2001, Klimato kaita, ežerų lygis, augalijos ir dirvožemių raida / In: Akmens amžius Pietų Lietuvoje, V.Baltrūnas (ed.), Vilnius, p. 132–135.

Kankaanpää, J., Rankama, T., 2009, The Sujala site in Utsjoki: Post-Swiderian in northern Lapland? / In: Mesolithic Horizons. Papers Presented at the Seventh International Conference on the Mesolithic in Europe, Belfast 2005 (*eds.* McCartan, S. B., Schulting, R., Warren, G., Woodman, P.), p. 38–44.

Karsten, P., Nilsson, B. (eds.), 2006, In the Wake of a Woman: Stone Age pioneering of North-Eastern Scania, Sweden, 10.000–5000 BC, The Årup settlements, Lund, 200 p.

Kashina, E., 2002, Anthropomorfic flint sculpture of the European Russian forest zone / In: Anthropologica et Praehistorica, Vol. 113, p. 51–60.

Kelly, R. L., 1995, The foraging spectrum diversity in hunter gatherer lifeways, p. 112.

Koltsov, L. V., Zhilin, M. G., 1999, Tanged point cultures in the upper Volga basin / In: Tanged points cultures in Europe, p. 346–360.

Kowalski, K., Płonka, T., 2011, New ornamented artefacts from the Polish Lowland and Final Palaeolithic Symbolism / In: Humans, environment and chronology of the Late Glacial of the North European Plain, p. 179–185.

Kozłowski, S. K., 1975, Cultural Differentiation of Europe from 10th to 5th Millennium B.C. (Zróżnicowanie kulturowe Europy w X-V tysiącleciach P.N.E.), Warsaw, p. 180–181, 217, Fig. 2.

Kozłowski, J. K., Kozłowski, S. K., 1977, Epoka kamienia na ziemiach Polskich, Warszawa, 387 p.

Kozłowski, S. K., 1980, Atlas of the Mesolithic in Europe (First Generation Maps), University of Warsaw, 212 p.

Kozłowski, S. K., 1989, Mesolithic in Poland: A New Approach, Warsaw, 246 p.

Kozłowski, J. K., Kozłowski, S., 1996, Le Paléolithique en Pologne, Collection L'Homme des Origines, No. 2, Série 'Préhistoire d'Europe', 239 p.

Kozłowski, S. K., 2001, Tanged Points Cultures in Europe, 364 p.

Kriiska, A., Lõugas, L., 2009, Stone Age settlement sites on an environmentally sensitive coastal area along the lower reaches of the River Pärnu (south-western Estonia), as indicators of changing settlement patterns, technologies and economies / In: Mesolithic Horizons. Papers Presented at the Seventh International Conference on the Mesolithic in Europe, Belfast 2005 (*eds.* McCartan, S. B., Schulting, R., Warren, G., Woodman, P.), p. 171.

Kulikauskas P., Kulikauskienė R., Tautavičius A., 1961, Lietuvos archeologijos bruožai, Valstybinė politinės ir mokslinės literatūros leidykla, Vilnius, 561 p.

Kurila, L., 2005 Gudelių (Lenkiškių) pilkapynas / In: Archeologiniai tyrinėjimai Lietuvoje 2002 metais, Vilnius, p. 69–72.

Kurila, L., 2005 Gudelių (Lenkiškių) pilkapynas / In: Archeologiniai tyrinėjimai Lietuvoje 2003 metais, Vilnius, p. 91–93.

Kurila, L., 2006 Gudelių (Lenkiškių) pilkapynas / In: Archeologiniai tyrinėjimai Lietuvoje 2004 metais, Vilnius, p. 80–83.

Kurila, L., 2006 Gudelių (Lenkiškių) pilkapynas / In: Archeologiniai tyrinėjimai Lietuvoje 2005 metais, Vilnius, p. 92–96.

Kurila, L., 2007 Gudelių (Lenkiškių) pilkapynas / In: Archeologiniai tyrinėjimai Lietuvoje 2006 metais, Vilnius, p. 121–124.

Kurila, L., 2008 Gudelių (Lenkiškių) pilkapynas / In: Archeologiniai tyrinėjimai Lietuvoje 2007 metais, Vilnius, p. 160–163.

Kurila, L., 2009 Gudelių (Lenkiškių) pilkapynas / In: Archeologiniai tyrinėjimai Lietuvoje 2008 metais, Vilnius, p. 106–108.

Kurilienė, A., 2009, Kaišiadorių rajono archeologijos sąvadas, Vilnius.

Küssner, M., 2010, The Late Upper Palaeolithic in the catchment area of the River Saale – facts and considerations (Die spate Altsteinzeit im Einzugsgebiet der Saale – Fakten und Überlegungen / In: Quartär, Vol. 57, p. 125–137.

Kuznetsov, O. V., 2010, Ethnoarchaeology in Siberia: an implication to Late Palaeolithic Settlements analysis / In: Treballs d'Etnoarcqueologia, No. 6: Etnoarqueología de la Prehistoria: más allá de la analogía, p. 173–188.

Larsson, L., 2004, The Mesolithic period in Southern Scandinavia:with special reference to burials and cemeteries / In: Mesolithic Scotland and its Neighbours, ed. A Saville, Edinburg:Society of Antiquaries of Scotland, p. 371–392.

Larsson, L., 2009, After the cold: Mammal finds, hunting and cultural affinities during the Preboreal / In: Humans, Environment and Chronology of the Late Glacial of the North European Plain, Proceedings of Workshop 14 (Commission XXXII) of the 15th U.I.S.P.P. Congress, Lisbon, September 2006, (*eds*. Street, M., Barton, N., Terberger, T.), p. 131–140.

Larsson, L., Sjöström, A., 2011, Bog sites and wetland settlement during the Mesolithic: Research from a bog in Central Scania, Southern Sweden / In: Archäologisches korrespondenzblatt, Vol. 41, p. 460–462.

Larsson, L., Nilsson Stutz, L., Zagorska, I., Bērziņš, V., Ceriņa, A., 2017, New aspects of the Mesolithic–Neolithic cemeteries and settlement at Zvejnieki, Northern Latvia / In: Acta Archaeologica, Vol. 88, Iss. 1, p. 57–93.

Lee, R. B., Devore, I. (eds.), 1968, Man the Hunter. The first intensive survey of a single, crucial stage of human development – man's once universal hunting way of life, 415 p.

Lee, R. B., Daly, R. (eds.), 2012, The Cambridge Encyclopedia of Hunters and Gatherers, 538 p.

Leroi-Gourhan, A., 1971, Prähistorische Kunst: Die Ursprünge der Kunst in Europa / In: Grose Epochen der Weltkunst, Ars Antiqua, Freiburg, 602 p.

Libera, J., 1995, Późny paleolit i mezolit środkowowschodniel Polski, Część pierwsza (Part one): Analiza, 181 p.

Luchtanas, A., 1984, Gyvenvietės prie Kernavės tyrinėjimai 1983 m. / In: Archeologiniai tyrimai Lietuvoje 1982-1983 metais, Vilnius, p. 28–31.

Luchtanas, A., 1986, Gyvenvietė Kernavėje Neries krante / In: Archeologiniai tyrimai Lietuvoje 1984-1985 metais, Vilnius, p. 30–32.

Luchtanas, A., 1990, Žvalgomieji tyrinėjimai Kernavėje ir jos apylinkėse / In: Archeologiniai tyrimai Lietuvoje 1988-1989 metais, Vilnius, p. 193–196.

Luchtanas, A., 1992, Kernavės pušyno prie Neries archeologiniai tyrinėjimai 1991 m. / In: Archeologiniai tyrinėjimai Lietuvoje 1990-1991 metais, Vol. 1, Vilnius, p. 27–29.

Luchtanas, A., 1998, Gyvenviečių ir kapinyno tyrinėjimai Kernavėje, Pajautos slėnyje, 1996 ir 1997 metais / In: Archeologiniai tyrinėjimai Lietuvoje 1996-1997 metais, Vilnius, p. 82–86.

Luchtanas, A., 2004, Gyvenviečių tyrinėjimai Kernavėje, Pajautos slėnyje / In: Archeologiniai tyrinėjimai Lietuvoje 2003 metais, Vilnius, p. 43–45.

Luchtanas, A., 2005, Žvalgomieji archeologiniai tyrinėjimai Kernavėje, Pajautos slėnyje / In: Archeologiniai tyrinėjimai Lietuvoje 2002 metais, Vilnius, p. 31.

Marchack, A., 1983, European Upper palaeolithic–mesolithic symbolic continuity. A cognitive, comparative study of ritual marking / In: Proceedings the intellectual expressions of prehistoric man. Art and religion, p. 111–120.

Marcinkevičiūtė, E., Šatavičius, E., 2013, Skarulių pilkapių vietos tyrimai / In: Archeologiniai tyrinėjimai Lietuvoje 2012 metais, Vilnius, p. 23–26.

Marcinkevičiūtė, E., Šatavičius, E., 2014, Skarulių pilkapių vietos tyrimai / In: Archaeologiniai tyrinėjimai Lietuvoje 2013 metais, Vilnius, p. 23–27.

Marcinkevičiūtė, E., Šatavičius, E., 2014, Verbiškių gyvenvietės 1 ir jos aplinkos žvalgomieji tyrimai / In: Archaeologiniai tyrinėjimai Lietuvoje 2013 metais, p. 27–29.

Marcinkevičiūtė, E., Šatavičius, E., 2015, Skarulių pilkapių vietos tyrimai / In: Archaeologiniai tyrinėjimai Lietuvoje 2014 metais, Vilnius, p. 57–62.

Marshack, A., 1970, New techniques in the analysis and interpretation of Mesolithic notation and symbolic art / In: Actes du Symposium International d'Art Préhistorique, Valcamonica Symposium, Capo di Ponte, p. 479–480.

Marshack, A., 1979, European Upper Palaeolithic–Mesolithic symbolic continuity: A Cognitive, Comparative Study of Ritual Marking / In: Valcamonica Symposium III, The Intellectual Expressions of Prehistoric Man: Art and Religion, p. 117, fig. 70.

McComb, A. M. G., 2009, The ecology of hazel (Corylus avelana) nuts in Mesolithic Ireland / In: Mesolithic Horizons. Papers Presented at the Seventh International Conference on the Mesolithic in Europe, Belfast 2005 (*eds.* McCartan, S. B., Schulting, R., Warren, G., Woodman, P.), Vol. 1, p. 225–231.

Merino, J. M., 1980, Tipologia litica / In: Munibe, Suplemento No. 4, p. 251–253.

Milisauskas, S., 2002, European Prehistory: A Survey, New York, 445 p.

Nelson, R. K., 1973, Hunters of the northern forest, Designs for survival among the alaskan Kutchin, University of Chicago Press, 303 p.

Nemickienė, R., Merkevičius, A., 2009, Kelio ties Grigiškėmis žvalgomieji tyrinėjimai / In: Archeologiniai tyrinėjimai Lietuvoje 2008 metais, Vilnius, p. 22–23.

Obuchowski, W., 2009, Materiały paleolityczne i mezolityczne z zachodniej Białorusi / In: Światowit – Suppement Series P: Prehistory and Middle Ages, Vol. XVI, Warszawa, 296 p.

Ostrauskas, T., 1999, Kabelių 2-oji akmens amžiaus gyvenvietė / In: Lietuvos archeologija, Vol. 16, Vilnius, p. 31–66.

Ostrauskas, T., 1999, Vėlyvasis paleolitas ir mezolitas Pietų Lietuvoje / In: Lietuvos archeologija, Vilnius, Vol. 16, p. 7–17.

Ostrauskas, T., 1999, Kabelių 2-oji akmens amžiaus gyvenvietė / In: Lietuvos archeologija, Vol. 16, Vilnius, p. 31–66.

Ostrauskas, T., 2000, Tyrinėjimai Margionių titnago kasyklų ir dirbtuvių komplekse 1999 m. / In: Archeologiniai tyrinėjimai Lietuvoje 1998 ir 1999 metais, Vilnius, p. 50–51.

Ostrauskas, T., 2002, Kundos kultūros tyrinėjimų problematika / In: Lietuvos archeologija, Vol. 23, Vilnius, p. 93–106.

Ostrauskas, T., 2002, Apie vėlyvojo paleolito periodizaciją Lietuvoje. E. Šatavičiaus koncepcijos kritika / In: Lietuvos archeologija, Vol. 23, Vilnius, p. 239–246.

Ostrauskas, T., 2002, Kundos kultūros tyrinėjimų problematika / In: Lietuvos archeologija, Vol. 23, Vilnius, p. 93–106.

Ostrauskas, T., 2002, Mezolitinė Kudlajevkos kultūra Lietuvoje / In: Lietuvos archeologija, Vol. 23, Vilnius, p. 137–162.

Pales, L., 1981, Les gravures de la marche, Vol. 1-4.

Pigeot, N., 2004, Les derniers magdaléniens d'Étiolles. Perspectives culturelles et paléohistoriques / In: Suplément à Gallia Préhistoire, No. 37, 360 p.

Piličiauskas, G., Jurkėnas, D., Laurat, T., 2011, Neandertaliečiai Lietuvoje? Prielaidos, tyrimai ir perspektyvos / In: Lietuvos archeologija, Vilnius, Vol. 37, p. 9–24.

Płonka, T., 2003, Portable art of the early Mesolithic, Wrocław, 612 p.

Probst, B., 1989, Rastplätze spätaltsteinzeitlicher Jägergruppen von Berlin-Tegel (mit einer Expertise von F. Scheingruber) / In: Ausgrabungen in Berlin, Nr. 8, Wissenschaftsverlag Volker Spiess Berlin, 206 p.

Puzinas, J., 1938, Naujausių proistorinių tyrinėjimų duomenys (1918-1938 metų Lietuvos proistorinių tyrinėjimų apžvalga), Kaunas, 131 p.

Puzinas, J., 1938, Stand der archäologischen Forschungen in Litauen / In: Pirmā Baltijas vēsturnieku konference Rīgā, 16.–20. VIII. 1937, 588 p.

Puzinas, J., 1940, Lietuvos proistorės bruožai / In: Naujoji mokykla. Kraštotyra, Vol. III, p. 103 and 106.

Ralska-Jasiewiczowa, M., Goslar, T., Madeyska, T., Starkel, L. (eds.), 1998, Lake Gościąż, Central Poland. A Monographic Study, Part 1, 340 p.

Rankama, T., Kankaanpää, J., 2011, First evidence of eastern Preboreal pioneers in arctic Finland and Norway / In: Quartär, Vol. 58, p. 183–209.

Rausch, R. L., 1951, Notes on the Nunamiut Eskimo and Mammals of the Anaktuvuk Pass Region, Brooks Range, Alaska, Arctic Institute of North America.

Riches, D., 1982. Northern Nomadic Hunter-Gatherers. A Humanistic Approach. New York: Academic Press, 240 p.

Rimantienė, R., 1974, Akmens amžiaus paminklai / In: Lietuvos TSR archeologijos atlasas. Akmens ir žalvario amžiaus paminklai, Vol. I, LTSR Mokslų akademijos istorijos institutas, Vilnius.

Rimantienė, R., 1984, Akmens amžius Lietuvoje, Vilnius, 342 p.

Rimantienė, R., 1996, Akmens amžius Lietuvoje, Vilnius, 342 p.

Rimkutė G., 2014, Dūkštelių akmens amžiaus gyvenvietės 1 kasinėjimai / In: Archeologiniai tyrinėjimai Lietuvoje 2013 metais, Vilnius, p. 40–43.

Rimkutė, G., 2012, Netitnaginių uolienų apdirbimo technologijos ir dirbinių gamyba finaliniame paleolite–mezolite Lietuvoje / In: Archaeologia Lituana, Vol. 13, Vilnius, p. 29–65.

Rimkutė, G., 2013, Skauduliškių–Dūkštelio ežerų mikroregiono žvalgomieji tyrimai / In: Archeologiniai tyrinėjimai Lietuvoje 2012 metais, Vilnius, p. 587–590.

Rimkutė, G., 2014, Dūkštelių akmens amžiaus gyvenvietės 1 kasinėjimai / In: Archeologiniai tyrinėjimai Lietuvoje 2013 metais, Vilnius, p. 40–43.

Rockman, M., Steele, J. (eds.), 2003, Colonization of Unfamiliar Landscapes: The archaeology of adaptation, 272 p.

Rust, A., 1943, Die alt- und mittelsteinzeitlichen Funde von Stellmoor, Neumünster, Karl Wachholtz Verlag, 240 p.

Schild, R., 2014, Całowanie. A Final paleolithic and Early Mesolithic Site on an Island in the Ancient Vistula Channel, Instytut Archeologii i Etnologii PAN, 376 p.

Schmidt, R. R., 1922, Die Kunst der Eiszeit.

Séara, F., Rotillon, S., Cupillard, Ch. (eds.), 2002, Campements mésolithiques en Bresse jurassienne, Paris, 329 p.

Shild, R., 2009, Paleolityczne figurki kobiet z Wilczyc / In: Archeologia Żywa, Vol. 4, p. 8–11.

Siemaszko, J., 1999, Stone Age settlement in the Lega Valley microregion of north-east Poland / In: European Journal of Archaeology, No. 2 (3), p. 293–312.

Sieveking, A., 1987, Engraved Magdalenian Plaquettes: a regional and stylistic analysis of stone, bone and antler plaquettes from Upper Palaeolithic sites in France and Cantabric Spain, BAR International Series, book 369, 238 p.

Sinitsyna, G. V., Spiridonova, E. A., 2017, On the chronology and distribution of the swiderian culture in the upper Volga Lakeland / In: Stratum plus. Archaeology and Cultural Anthropology, p. 111–126.

Sjöström, A., Nilsson, B., 2009, 'Rulers' of southern Sweden: technological aspects of a rediscovered tool / In: Mesolithic Horizons. Papers Presented at the Seventh International Conference on the Mesolithic in Europe, Belfast 2005 (*eds.* McCartan, S. B., Schulting, R., Warren, G., Woodman, P.), p. 788–794.

Sobkowiak-Tabaka, I., Kubiak-Martens, L., Okuniewska-Nowaczyk, I., Ratajczak-Szczerba, M., Kurzawska, A., Kufel-Diakowska, B., 2018, Reconstruction of the Late Glacial and Early Holocene landscape and human presence in Lubrza, Western Poland, on the basis of multidisciplinary analyses / In: Environmental Archaeology, Vol. 23:2, p. 123–136.

Sommer, R. S., Benecke, N., Lõugas, L., Nelle, O., Schmölcke, U., 2011, Holocene survival of the wild horse in Europe: a matter of open landscape? / In: Journal of Quaternary Science, Vol. 26(8), p. 805–812.

Sommer, R., Benecke, N., 2005, Late-Pleistocene and early Holocene history of the canid fauna of Europe (Canidae) / In: Mammalian Biology – Zeitschrift für Säugetierkunde, Vol. 70, Iss. 4, p. 227–241.

Sørensen, M., Rankama, T., Kankaanpää, J., Knutsson, K., Knutsson, H., Melvold, S., Eriksen, B. V., Glørstad, H., 2013, The First Eastern Migrations of People and Knowledge into Scandinavia: Evidence from Studies of Mesolithic Technology, 9th-8th Millennium BC / In: Norwegian Archaeological Review, p. 1–37.

Sorokin, A. N., 1995, On the Problem of Influence of Volga-Oka Mesolithic to the Origine of Kunda Culture / In: L'Europe des derniers chasseurs, 5e Colloque international UISPP, 18–23 September, p. 425–428.

Stančikaitė, M., Kisielienė, D., Moe, D., Vaikutienė, G., 2008, Lateglacial and early Holocene environmental changes in northeastern Lithuania / In: Quaternary International, p. 80–92.

Strazdas, A., 1990, Gudelių-Lenkiškių pilkapyno tyrinėjimai / In: Archeologiniai tyrinėjimai Lietuvoje 1988 ir 1989 metais, Vilnius, p. 63–65.

Street, M., Gelhausen, F., Grimm, S., Moseler, F., Niven, L., Sensburg, M., Turner, E., Wenzel, S., Jöris, O., 2006, L'occupation du bassin de Neuwied (Rhénanie centrale, Allemagne) par les Magdaléniens et les groupes à Federmesser (aziliens) / In: Bulletin de la Société préhistorique française, Vol. 103, No. 4, p. 753–780.

Strimaitienė, A., 2003, Žvalgymai Jaros ir Maleišos upių slėniuose (Anykščių r.) / In: Archeologiniai tyrinėjimai Lietuvoje 2002 metais, Vilnius, p. 291–294.

Sturdy, D., 1975, Some reindeer economies in prehistoric Europe / In: Palaeoeconomy, Cambridge, p. 55–95.

Sułgostowska, Z., 1989, Prahistoria międzyrzecza Wisły, Niemna i Dniestru u schyłku plejstocenu, Panstwowe Wydawnictwo Naukowe, Warszawa, 254 p.

Sulgostowska, Z., 1999, Final Palaeolithic Masovian cycle and Mesolithic Kunda Culture Relations / In: Tanged Points Cultures in Europe (*eds*. Kozłowski, S. K., Gurba, J., Zaliznyak, L. L.), Vol. 13, Lublin, p. 86–92.

Sulgostowska, Z., 2003, Mesolithic Colonisation of South-Eastern Subbalticum / In: Mesolithic on the Move, Papres presented at the Sixth International Conference on the Mesolithic in Europe, Stockholm, 2000, (*ed*. Larsson, L.), p. 47–51.

Szymczak, K., 1999, Late Palaeolithic cultural units with tanged points in North Eastern Poland / In: Tanged points cultures in Europe (*eds.* Kozłowski, S. K., Gurba, J., Zaliznyak, L. L.), Vol. 13, Lublin, p. 93–101.

Szymczak, K., 2000, Late glacial in Poland – cultural differentiation / In: L'Europe Centrale et septentrionale au tardiglaciaire. Confrontation des modèles régionaux de peuplement, Actes de la Table-ronde international de Nemours, 1997 (*eds.* Valentin, B., Bodu, P., Christensen, M.), p. 2.

Šatavičius, E., 1992, Pasienių I mezolitinės stovyklavietės tyrinėjimai / In: Archeologiniai tyrinėjimai Lietuvoje 1990-1991 metais, Vol. 1, Vilnius, p. 34–37.

Šatavičius, E., 1994, Pasienių 1-osios akmens amžiaus gyvenvietės tyrinėjimai / In: Archeologiniai tyrinėjimai Lietuvoje 1992-1993 metais, Vilnius, p. 34–36.

Šatavičius, E., 1996, Vilniaus rajono akmens amžiaus paminklų tyrinėjimai / In: Archeologiniai tyrinėjimai Lietuvoje 1994-1995 metais, Vilnius, p. 26–29.

Šatavičius, E., 1997, Vėlyvoji Svidrų kultūra / In: Kultūros paminklai, Vilnius, Vol. 4, p. 3–15.

Šatavičius, E., 1998, Pasienių 1-osios akmens amžiaus gyvenvietės tyrinėjimai / In: Archeologiniai tyrinėjimai Lietuvoje 1996-1997 metais, Vilnius, p. 41–43.

Šatavičius, E., 1998, The Early Mesolithic Site of Pasieniai I / In: Pact 54, Bergen, p. 157–169.

Šatavičius, E., 2000, Nauji akmens amžiaus paminklai Rytų ir Pietų Lietuvoje/ In: Archeologiniai tyrinėjimai Lietuvoje 1998-1999 metais, Vilnius, p. 76–81.

Šatavičius, E., 2002, Pasienių 1-osios akmens amžiaus gyvenvietė / In: Archeologiniai tyrinėjimai Lietuvoje 2001 metais, Vilnius, p. 34–36.

Šatavičius, E., 2004, Bromės (Liungbiu) kultūra Lietuvoje / In: Lietuvos archeologija, Vol. 25, Vilnius, p. 17–44.

Šatavičius, E., 2005, Svidrų kultūra Lietuvoje / In: Lietuvos archeologija, Vol. 29, Vilnius, p. 133–170.

Šatavičius, E., 2005, Žvalgymai ir žvalgomieji tyrimai Rytų ir Pietų Lietuvoje / In: Archeologiniai tyrinėjimai Lietuvoje 2004 metais, Vilnius, p. 291–305.

Šatavičius, E., 2006, Archeologiniai žvalgymai ir žvalgomieji tyrimai Pietų ir Rytų Lietuvoje / In: Archeologiniai tyrinėjimai Lietuvoje 2005 metais, Vilnius, p. 284–400.

Šatavičius, E., 2007, Žvalgymai ir žvalgomieji tyrimai Pietų ir Rytų Lietuvoje / In: Archeologiniai tyrinėjimai Lietuvoje 2006 metais, Vilnius, p. 473–487.

Šatavičius, E., 2011, Akmens amžiaus gyvenviečių paieška ir tyrimai Pietų bei Rytų Lietuvoje / In: Archeologiniai tyrinėjimai Lietuvoje 2010 metais, Vilnius, p. 18–25.

Šatavičius, E., 2011, Neravų senovės gyvenvietės tyrimai 2009–2010 metais / In: Archeologiniai tyrinėjimai Lietuvoje 2010 metais, Vilnius, p. 25–33.

Šatavičius, E., 2012, Pasieniai 1 settlement / In: Archaeological Investigations in Independent Lithuania (1990–2010). Vilnius, p. 21–26.

Šatavičius, E., 2012, Titnago kasimo ir apdirbimo dirbtuvės prie Titno ežero / In: Archaeologia Lituana, Vol. 13, Vilnius, p. 66–83.

Šatavičius, E., 2012, Titnago kasimo ir apdirbino dirbtuvės prie Titno ežero / In: Archaeologia Lituana, Vol. 13, Vilnius, p. 66–83.

Šatavičius, E., 2013, Naujos akmens amžiaus gyvenvietės Pietų ir Rytų Lietuvoje / In: Archeologiniai tyrinėjimai Lietuvoje 2012 m., Vilnius, p. 34–39.

Šatavičius, E., 2016, The First Palaeolithic Inhabitants and the Mesolithic in Lithuanian Territory / In: A Hundred Years of Archaeological Discoveries in Lithuania, Vilnius, p. 8–39.

Šatavičius, E., Marcinkevičiūtė, E., 2011, Skarulių pilkapių vietos tyrimai 2009–2010 metais / In: Archeologiniai tyrinėjimai Lietuvoje 2010 metais, Vilnius, p. 102–113.

Šatavičius, E., Marcinkevičiūtė, E., 2012, The excavation of Neravai ancient settlement / In: Archaeological Investigations in Independent Lithuania (1990-2010). Vilnius, p. 35–39.

Tarasenka, P., 1922, Ieškojimai Neries ir Šventosios santeklyje / In: Mūsų senovė, Vol. 1, book No. 4–5, p. 574–590.

Tarasenka, P., 1924, Panerio pirmykštės kultūros sėdybos (Nuo Kernavės iki Kauno) / In: Kultūra, Mėnesinis iliustruotas mokslo populiarus žurnalas su „Daigų" priedu, No. 7–8, Kaunas, p. 299–310.

Tarasenka, P., 1925, Gimtoji senovė. Ieškojimas, pažinimas, apsaugojimas, Kaunas, 117 p.

Tarasenka, P., 1927, Priešistorinė Lietuva, Kaunas, 142 p.

Tarasenka, P., 1928, Lietuvos archeologijos medžiaga. Materialien für litauische Archeologie, Kaunas, 358 p.

Taute, W., 1968, Die Stielspitzen-Gruppen im Nördlichen Mitteleuropa. Ein Beitrag zur Kenntnis der späten Altsteinzeit / In: Fundamenta, A-5, Böhlau, Verlag, Köln, Graz, 326 p.

Telegin, D., Okhrimenko, G., 1999, A Dwelling of the Swiderian Culture from Malaya Osnitsa in Volhynia (Ukraine) / In: Tanged points cultures in Europe (*eds.* Kozłowski, S. K., Gurba, J., Zaliznyak, L. L.), Vol. 13, Lublin, p. 292–296.

Tymula, S., 2002, L'arte solutréen du Roc de Sers (Charente) / In: Documents d'archéologie française, Vol. 91, Paris, 165 p.

Ukkonen, P., Lõugas, L., Zagorska, I., Lukševica, L., Lukševics, E., Daugnora, L., Jungner, H., 2006, History of the reindeer (Rangifer tarandus) in the eastern Baltic region and its implications for

the origin and immigration routes of the recent northern European wild reindeer populations / In: Boreas, Vol. 35, Iss. 2, p. 222–230.

Vanagas, A., 1981, Lietuvių hidronimų etimologinis žodynas, Vilnius, p. 409 p.

Veil, S., Breest, K., Grootes, P., Nadeau, M. J., Hüls, M., 2012, A 14 000-year-old amber elk and the origins of northern European art / In: Antiquity, 86, p. 660–673.

Vėlius, G., Vengalis, R., 2016, Tyrimai Kernavės archeologinėje vietovėje / In: Archeologiniai tyrinėjimai Lietuvoje 2015 metais, p. 141–148, Vilnius.

Vengalis, R., 2006, Semeniškių 2-oji neįtvirtinta gyvenvietė / In: Archeologiniai tyrinėjimai Lietuvoje 2004 metais, Vilnius, p. 58–61.

Vengalis, R., 2009, Semeniškių neįtvirtintos gyvenvietės / In: Archeologiniai tyrinėjimai Lietuvoje 2008 metais, Vilnius, p. 81.

Vengalis, R., 2011, Kernavės senovės gyvenvietės ir miesto archeologiniai tyrimai magnetinių anomalijų vietose / In: Archeologiniai tyrinėjimai Lietuvoje 2010 metais, Vilnius, p. 83–87.

Vengalis, R., 2014, Tyrimai Kernavės senovės gyvenvietėje / In: Archeologiniai tyrinėjimai Lietuvoje 2013 metais, Vilnius, p. 98–104.

Vengalis, R., 2014, Žvalgomieji tyrimai Neries slėnyje, tarp Dūkštų ir Čiobiškio / In: Archeologiniai tyrinėjimai Lietuvoje 2013 metais, Vilnius, p. 105–120.

Vengalis, R., 2015, Žvalgomieji tyrimai Ardiškyje / In: Archeologiniai tyrinėjimai Lietuvoje 2014 metais, Vilnius, p. 68–71.

Vengalis, R., 2015, Žvalgomieji tyrimai Kernavės apylinkėse / In: Archeologiniai tyrinėjimai Lietuvoje 2014 metais, Vilnius, p. 105–117.

Vengalis, R., 2016, Mitkiškių senovės gyvenvietė / In: Archeologiniai tyrinėjimai Lietuvoje 2015 metais, p. 86–91, Vilnius.

Vengalis, R., 2017, Kernavės apylinkių žvalgymai / In: Archeologiniai tyrinėjimai Lietuvoje 2016 metais, Vilnius, p. 458–465.

Vengalis, R., Juškaitis, V., Pilkauskas, M., Kozakaitė, J., 2016, Kvietinių senovės gyvenvietė ir pilkapynas / In: Archeologiniai tyrinėjimai Lietuvoje 2015 metais, Vilnius, p. 74–86.

Vėlius, G., 2011, Neįtvirtintos gyvenvietės prie Neries / In: Archeologiniai tyrinėjimai Lietuvoje 2010 metais, Vilnius, p. 87–93.

Villaverde Bonilla, V., 1994, Arte paleolitico de la Cova del Parpallo. Estudio de la coleccion de plaquetas y cantos grabados y pintados, Vol. 2, 316 p.

Walls, M., 2009, Caribou Inuit Traders of the Kivalliq Nunavut, Canada, BAR International Series, book 1895, Oxford, 73 p.

Weniger, G. C., 1989, The Magdalenian in western central Europe: settlement pattern and regionality / In: Journal of World Prehistory, Vol. 3, p. 323–372.

Wildgen, W., 2004, The Paleolithic origins of art, its dynamic and topological aspects, and the transition to writing / In: Semiotic Evolution and the Dynamics of Culture, Vol. 5, Germany, Bern, p. 111–148.

Zabiela, G., 1996, Kriokšlio pilkapių vietos tyrinėjimai 1994 metais / In: Archeologiniai tyrinėjimai Lietuvoje 1994 ir 1995 metais, Vilnius, p. 89–92.

Zagorska, I., 1995, Late Glacial and Early Postglacial finds in the Latvian coastal area / In: Man and Sea in the Mesolithic (*ed.* Fischer, A.), Oxford, p. 251–258.

Zagorska, I., 1996, Late Palaeolithic Finds in the Daugava River Valley / In: The Earliest Settlement of Scandinavia and its relationship with neighbouring areas (ed. Larsson, L.), Acta Archaeologica Lundensia, No. 24, Lund, p. 263–272.

Zagorska, I., 1999, The earliest settlement of Latvia / In: PACT, Vol. 57, Bergen, p. 131–156.

Zagorska, I., 2012, The ancient reindeer hunters in Latvia, Rīga, 206 p.

Zagorskis, F., 1987, Zvejnieku akmens laikmeta kapulauks, Rīga, 130 p.

Zaliznyak, L. L., 1995, The Swiderian reindeer-hunters of Eastern Europe, Beiträge zur Ur- und Frühgeschichte Mitteleuropas 5, 140 p.

Zaliznyak, L., 1997, Mesolithic Forest Hunters in Ukrainian Polessye, BAR International Series, book 659, England, 140 p.

Zaliznyak, L. L., 1999, Tanged points cultures in the western part of Eastern Europe / In: Tanged points cultures in Europe (*eds.* Kozłowski, S. K., Gurba, J., Zaliznyak, L. L.), Lublin, Vol. 13, p. 232–242.

Zaliznyak, L., 2000, R. Rimantienė as founder of the periodization of the Final Palaeolithic of North-West Eastern Europe / In: Lietuvos archeologija, Vol. 19, Vilnius, p. 31–45.

Zanevičius, K., 2004, Megėjiška žūklė. Teorija ir praktika, 376 p.

Zedeño, M. N., Stoffle, R. W., 2003, Tracking the Role of Pathways in the Evolution of a Human Landscape: The St. Croix Riverway in Ethnohistorical Perspective / In: The Colonization of Unfamiliar Landscapes, London, p. 59–80.

Zervos, Ch., 1959, L'Art de l'époque du renne en France, 499 p.

Zhilin, M., 1996, The Western Part of Russia in the Late Palaeolithic–Early Mesolithic / In: Earliest Settlement of Scandinavia. Acta Archaeologica Lundensia, No. 80, p. 278–282.

Zhilin, M. G., 2004, The use of living space at Mesolithic sites in Central Russia / In: The Use of Living Space in Prehistory (ed. Smyntyna, O. V.), Papers from a session held at the European Association of Archaeologists Sixth Annual Meeting in Lisbon 2000, BAR International Series, book 1224, p. 79–89.

Zimaitytė, E., 2008, Skarulių pilkapių vieta / In: Archeologiniai tyrinėjimai Lietuvoje 2007 metais, Vilnius, p. 114–117.

Zvelebil, M., 2003, People behind the lithics. Social life and social conditions of Mesolithic communities in temperate Europe / In: Peopling the Mesolithic in a northern environment (eds. Bevan, L., Moore, J.), Oxford, p. 1–23.

Zvelebil, M., 2008, Innovating Hunter-Gatherers: The Mesolithic in the Baltic / In: Mesolithic Europe (*eds*. Bailey, G. and Spikins, P.), Cambridge, p. 18–59.

Борисковский, П. И., 1984, Археология СССР: Палеолит СССР, Москва, 384 p.

Борисковський, П. І., 1949, Палеоліт і неоліт України, Археологічні досліди на Десні, Vol. 1, Kiev.

Гроздовер, М. Д., Леонова, Н. Б., 1977, Клад кремня из верхнепалеолитической стоянки Каменная Балка II / In: Проблемы палеолита Восточной и Центральной Европы, p. 127–136.

Гурина, Н. Н., 1966, К вопросу о позднепалеолитических и мезолитических памятниках Польши и возможности сопоставления с ними памятников северозападной Белоруссии / In: Материалы и исследования по археологии СССР, У истоков древних культур (эпоха мезолита), No. 126, Москва, Ленинград, 238 p.

Зализняк, Л. Л., 1989, Охотники на северного оленя Украинского Полесья эпохи финального палеолита, Киев: Наукова думка, 176 p.

Зализняк, Л. Л., 1991, Население Полесья в мезолите, Киев, "Наукова думка", 160 p.

Зализняк, Л. Л., 2005, Фінальний палеоліт і мезоліт континентальної України. Культурний поділ та періодизація / In: Кам'яна доба України, Вип. 8, Київ, Шлях, 184 p.

Замятнин, С. Н., 1948, Миниатюрные кремнёвые скульптуры в неолите северо-восточной Европы / In: Советская археология, Vol. 10, p. 85–123.

Кларк, Дж. Г., 1953, Доисторическая Европа. Экономический очерк, 280 p.

Кольцов, Л. В., Жилин, М. Г., 2008, Финальный палеолит лесной зоны Европы (культурное своеобразие и адаптация), 313 p.

Ксензов, В. П., 2006, Мезолит Северной и Централной Беларуси / In: Материалы по археологii Беларусi, No. 13, Minsk, 170 p.

Копытин, В., 1999, Финалный палеолит и мезолит верхнего Поднепровья / In: Tanged points cultures in Europe (eds. Kozłowski, S. K., Gurba, J., Zaliznyak, L. L.), Vol. 13, Lublin, p. 256–266.

Лозе, И., 1988, Поселения каменного века Лубанской низины. Мезолит, ранний и средний неолит, Rīga, 209 p.

Маркин, С. В., 1986, Палеолитические памятники бассейна реки Томи, Новосибирск, Наука, 177 p.

Недомолкина, Н. Г., 2000, Сухонские кремневые фигурки / In: Тверской археологический сборник, Выпуск 4, Vol. 1, p. 224–232.

Першиц А. И., Монгайт А. П., Алексеев В. П., 1974, История первобытного общества: Учебник, 223 p.

Покровский Ф. В., 1899, Археологическая карта Ковенской губернии, Вильно.

Римантене, Р. К., 1960, Стоянка каменного и бронзового веков Самантонис / In: Советская археология, Vol. 2, p. 115–127.

Римантене, Р. К., 1971, Палеолит и мезолит Литвы, Вильнюс, 204 p.

Римантене, Р., 1968, Исследования стоянки каменного века в Литве, проводившиеся в 1948–1967 гг. / In: 20 лет: Материалы к отчетной конф. археолог. и этногр. экспедиции Ин-та истории АН Лит. ССР 1948–1967 гг., Вильнюс, p. 17–23.

Спицын, А., 1925, Литовские древности / In: Tauta ir žodis, Vol. 3, Kaunas, p. 112–171.

Шовкопляс, И. Г., 1965, Мезинская стоянка: к истории среднеднепровского бассейна в позднепалеолитическую эпоху, Киев, 325 p.

Яблонските-Римантене, Р., 1959, Стоянки каменного века в Эйгуляй / In: Вопросы этнической истории народов Прибалтики, Москва, p. 11–31.

Яблонските-Римантене, Р., 1966, Периодизация мезолитических стоянок Литвы / In: У истоков древних культур (эпоха мезолита), Материалы и исследования по археологии СССР, Москва, Ленинград, p. 75–87.

Consultations

K. Duderis (Biržai Region Museum „Sėla"), 2018.

Prof. Dr W. Kirleis (Christian-Albrechts-University Kiel, Institute of Prehistoric and Protohistoric Archaeology), 2016.

Dr H. Kroll (Christian-Albrechts-University Kiel, Institute of Prehistoric and Protohistoric Archaeology), 2016.

Assoc. Prof. A. Luchtanas (Vilnius University, Faculty of History, Department of Archaeology), 2017–2018.

Dr J. Meadows (Christian-Albrechts-University Kiel, Zentrum für Baltische und Skandinavische Archäologie), 2016.

Dr G. Motuzaitė-Matuzevičiūtė Keen (Vilnius University, Faculty of History, Department of Archaeology), 2013, 2017.

Hab. Dr R. Rimantienė, 2014–2017.

Dr K. C. Ritchie, (Zentrum für Baltische und Skandinavische Archäologie), 2016.

Assoc. Prof. E. Šatavičius (Vilnius University, Faculty of History, Department of Archaeology), 2013, 2017–2018.

Prof. P. Šinkūnas (Vilnius University, Institute of Geo-sciences, Department of Geology and Mineralogy), 2017–2018.

Prof. Dr L. L. Zaliznyak (Institute of Archaeology of Ukrainian National Academy of Sciences), 2013.

Hab. Dr M. Zhilin (Russian Academy of Sciences, Institute of Archaeology), 2016.

Reports of archaeological investigations:

Baleniūnas, P., 1943, Pranešimas iš komandiruotės 1943 m. liepos mėn. 7-19 d. / Samantonys / excavation report, Kaunas, 2 p.

Brazaitis, Dž., 2004, Pabartonių akmens amžiaus gyvenvietės (AR 212) žvalgomųjų tyrinėjimų ataskaita, Library of Lithuanian Institute of History, Archive 1, file No. 4185.

Gudaitienė (buv. Rimkutė), G., 2015, Pabartonių akmens amžiaus gyvenvietės (Jonavos r. sav.) archeologinių detaliųjų ir žvalgomųjų tyrimų 2014 m. ataskaita, Archive of the Lithuanian Institute of History, file No. 39-1-4498.

Gudaitienė, G., 2016, Pabartonių akmens amžiaus gyvenviečių, Pabartonių k., Jonavos r. sav., detaliųjų archeologinių tyrimų 2015 m. ataskaita, Archive of the Lithuanian Institute of History.

Ivanauskas, E., 1999, Neaiškių archeologijos objektų 1999 metų žvalgomieji archeologijos tyrimai Akmenės, Jonavos, Kaišiadorių, Mažeikių, Šakių ir Utenos rajonuose, Archive of the Lithuanian Institute of History, file No. 3418, Vilnius.

Ivanauskas, E., 2001, Jonavos rajono Skarulių pilkapių vietos 2001 m. žvalgomieji archeologijos tyrimai, Archive of the Lithuanian Institute of History, file No. 3832, Vilnius.

Jablonskytė-Rimantienė, R., 1954, Eigulių (Kaunas) akmens amžiaus stovyklos tyrinėjimai 1952-3 m., Kaunas, Archive of the Lithuanian Institute of History, file No. 62, Vilnius.

Kurila, L., 2005, Gudelių–Lenkiškių pilkapyno (Vilniaus r.) (A1237P) archeologinių tyrinėjimų 2004 metais ataskaita, excavation report, National Museum of Lithuania.

Kurila, L., 2006, Gudelių–Lenkiškių pilkapyno (Vilniaus r.) (A1237P) archeologinių tyrinėjimų 2005 metais ataskaita, excavation report, National Museum of Lithuania.

Kurila, L., 2007, Gudelių–Lenkiškių pilkapyno (Vilniaus r.) (A1237P) archeologinių tyrinėjimų 2006 metais ataskaita, excavation report, National Museum of Lithuania.

Kurila, L., 2008, Gudelių–Lenkiškių pilkapyno (Vilniaus r.) (A1237P) archeologinių tyrinėjimų 2007 metais ataskaita, excavation report, National Museum of Lithuania.

Kurila, L., 2009, Gudelių–Lenkiškių pilkapyno (Vilniaus r.) (A1237P) archeologinių tyrinėjimų 2008 metais ataskaita, excavation report, National Museum of Lithuania.

Luchtanas, A., 1990, Kapinynas ir gyvenvietės Kernavėje, Pajautos slėnyje (Mitkiškių vnk.) /Širvintų raj./ 1990 metų archeologinių tyrinėjimų ataskaita, Archive of the Lithuanian Institute of History, file No. 1727, Vilnius.

Luchtanas, A., 1991, Kapinyno ir gyvenviečių Kernavėje, Pajautos slėnyje (Mitkiškių vnk.) /Širvintų raj./ 1991 metų archeologinių tyrinėjimų ataskaita, Archive of the Lithuanian Institute of History, file No. 1826, Vilnius.

Luchtanas, A., 1997, Kernavės senovės gyvenvietės (AR 1660) 1997 m. archeologinių tyrinėjimų ataskaita, Archive of the Lithuanian Institute of History, file No. 2956, Vilnius.

Luchtanas, A., Merkytė, I., Abaravičius, G., 1989, Žvalgomieji tyrinėjimai Kernavės archeologijos ir istorijos rezervatinio muziejaus teritorijoje ir apylinkėse 1989 metais. Ataskaita /Kernavės alkvietė, Mitkiškių gyv., Kernavės (Kriveikiškių) piliak., Ardiškio gyv., Širvintų raj., Archive of the Lithuanian Institute of History, file No. 1659, Vilnius.

Marcinkevičiūtė, E., 2011, Skarulių pilkapių vietos tiesiant Jonavos pietrytinį aplinkkelį (kelio A6 Kaunas-Zarasai-Daugpilis 32,7-32,9 km ruožas) archeologinių tyrimų 2009-2010 m. ataskaita, Archive of the Lithuanian Institute of History, file No. 91228, Vilnius.

Puzinas, J., 1937, Eigulių II km. kapinyno tyrinėjimų ataskaita, 1935, 1937, 1938 m. / Copy of the file No. 424, State Museum in Kaunas, Archive of the Lithuanian Institute of History, No. 1131.

Rimantienė, R., 1997, Skarulių senovės gyvenvietės, Jonavos miestas, archeologinių žvalgomųjų tyrinėjimų 1997 metais ataskaita, Archive of the Lithuanian Institute of History, file No. 2817, Vilnius.

Strazdas, A., 1990, Gudelių (Lenkiškių), Buivydiškių apyl., Vilniaus raj., pilkapyno 1988-1989 m. tyrinėjimų ataskaita, excavation report, National Museum of Lithuania, No. IEM465.

Vengalis, R., 2017, Kernavės archeologinės vietovės (Širvintų r. sav., Kernavės sen.) archeologinių žvalgymų 2016 m. ataskaita, excavation report, Museum of Kernavė archaeological site, Kernavė.

Vengalis, R., 2017, Kernavės apylinkių (Elektrėnų, Širvintų r. ir Vilniaus r. sav.) archeologinių žvalgymų 2016 metais ataskaita, excavation report, Museum of Kernavė archaeological site, Kernavė.

Zimaitytė, E., 2009, Kelio A6 Kaunas-Zarasai-Daugpilis 32,7-32,9 km ruožo (Jonavos pietrytinis aplinkelis), Skarulių k., Jonavos r., 2008 m. archeologinių tyrinėjimų ataskaita, Archive of the Lithuanian Institute of History, file No. 5175, Vilnius.

Žalnierius, A., 1996, Artezinio gręžinio vietos žvalgomųjų archeologinių tyrimų ataskaita, Kaunas, Library of Lithuanian Institute of History, file No. 2722, p. 1–9.

Oral information in scientific events:

Akmens amžiaus gyvenvietės rekonstrukcijos galimybės Samantonių kaime, Conference, 2017 July 20th, Kurtuvėnai, Lithuania.

Eriksen, B. V., information provided in a lecture, Zentrum für Baltische und Skandinavische Archäologie, 15 February, 2016.

Šatavičius, E., 2017, Stipriai suardytų archeologinių vietovių tyrimai: Skarulių atvejis, presentation in a conference 'XIV Marijos Gimbutienės skaitymai', April 12.

Collections of artefacts:

Collection of archaeological finds from Verbiškės village area (various excavations), Lithuanian National Museum, Vilnius.

Collection of archaeological finds from various sites, Kaunas Vytautas the Great War Museum, Kaunas.

Collection of archaeological finds from various sites, Museum of Kernavė archaeological site, Kernavė.

D. Stončius collection of archaeological finds (2010–2012), National Museum of Lithuania, Vilnius.

K. Jablonskis collection of archaeological finds (1938–1949), National Museum of Lithuania, Vilnius.

Diaries and notes:

Dowgird, T., 1909, Dziennik badań archeologicznych od stycznia 1881 roku do 1 stycznia 1888 roku Tadeusza Dowgirda, Library of Vilnius University, Department of manuscripts, Archive No. 1.

Jablonskis, K., 1942, Survey diary, National Museum of Lithuania, Department of Archaeology, Vilnius.

Jablonskis, K., 1947, 1947 metai (Slownik), Survey diary, Archive of the Lithuanian National Museum, Department of Archaeology, Vilnius.

Rimantienė, R., (no date), Bartoniai, manuscript, the National Museum of Lithuania, Department of Archaeology, Vilnius.

Rimantienė, R., (no date), Drąseikiai, manuscript, the National Museum of Lithuania, Department of Archaeology, Vilnius.

Rimantienė, R., (no date), Eiguliai, manuscript, the National Museum of Lithuania, Department of Archaeology, Vilnius.

Rimantienė, R., (no date), Pabartoniai, manuscript, National Museum of Lithuania, Department of Archaeology, Vilnius.

Dissertations and thesis:

Bokelmann, K., 1971, Duvensee / Monographie eines mesolithischen Wohnplatzkomplexes in Schleiswig-Holstein / doctoral dissertation, Universität zu Köln.

Costamagno, S., 1999, Stratégies de Chasse et Fonction des Sites au Magdalénien dans le Sud de la France / Doctoral dissertation, Université de Bordeaux.

Holst, D., 2007, Subsistenz und Landschaftsnutzung im Frühmesolithikum: Nussröstplätze am Duvensee / Doctoral dissertation, University of Johannes Gutenberg, Mainz.

Jensen, J. F., 1993, Intrasite Analysis of Palaeo-Eskimo Campsites / Master thesis, University of Copenhagen.

Ostrauskas, T., 1998, Lietuvos mezolito gyvenviečių periodizacija / Doctoral dissertation, Vilnius University, Vilnius.

Šatavičius, E., 2001, Vėlyvojo paleolito kultūros ir jų likimas ankstyvajame mezolite / Doctoral dissertation, Vilnius University, Vilnius.

Winkler, K., 2018, Ahrensburgien und Swiderien im mittleren Oderraum. Technologische und typologische Untersuchungen an Silexartefakten der Jüngeren Dryaszeit / Doctoral dissertation, Christian-Albrechts University, Kiel.

Римантене, Р., 1962, Периодизация и топография поселений каменного и бронзового веков в Литве (По данным поселений центральной Литвы) / Автореферат диссертации на соискание ученой степени кандидата исторических наук, Вильнюс, 18 p., Archive of the Lithuanian Institute of History, file No. 461087.

Янитс, К. Л., 1990, Кремневый инвентарь стоянок Кундской культуры / Doctoral dissertation, Moscow.

Other sources:

Brazaitis, Dž., 2004, Archeologiniai tyrinėjimai Lietuvoje 2003 metais, p. 310, Table 1, Vilnius.

Information on the find labels in Kaunas Vytautas the Great War Museum.

Kavoliūtė, F., 2012, Lietuvos gamtinis pamatas, I dalis: Gelmės ir paviršius, Vilnius, Conspects of lectures, 90 p.

Lietuvos TSR Širvintų rajono kultūros ir gamtos paminklų katalogas, 1977, Respublikinis žemėtvarkos projektavimo institutas, Archive of the Centre of Cultural Heritage, Vilnius.

Lietuvos TSR Jonavos rajono kultūros ir gamtos paminklų katalogas, 1976, Respublikinis žemėtvarkos projektavimo institutas, Archive of the Centre of Cultural Heritage, Vilnius.

Lietuvos TSR Jonavos rajono gamtos, istorijos ir kultūros paminklų katalogas, 1988, 2nd edition, Respublikinis žemėtvarkos projektavimo institutas, Archive of the Centre of Cultural Heritage, Vilnius.

Taiga Nomads: Hundreds of Homes (Part 1), 1992, Documentary film series, Great Britain.

Tarybų Lietuvos enciklopedija, 1987, (ed. Vyriausioji enciklopedijų redakcija), Vol. 3, Vilnius, p. 205–207.

The IUCN Red List of Threatened Species, 2016, International Union for Conservation of Nature and Natural Resources (ISSN 2307-8235).