Abhandlung

Irina Khrustaleva*, Ihar Yazepenka, Maryia Tkachova, Elena Kalechits, Alexander Kolosov, Mikola Kryvaltsevich and Aivar Kriiska.

Pit-houses of the Stone Age Belarus in the 4th millennium BC

https://doi.org/10.1515/pz-2022-2062

Zusammenfassung: Es sind zurzeit 58 Gebäude aus dem Steinzeit in Belarus bekannt, die in der Nähe von 31 Siedlungsplätzen entdeckt worden sind. Der Beitrag richtet seine Aufmerksamkeit auf 21 Grubenhäuser im Süden von Belarus, die vermutlich in das 4. Jahrtausend v. Chr. datieren und in der Nähe von 13 Siedlungsplätzen gefunden wurden. Diese sind hauptsächlich mit den Kulturen von Ost-Polesien und dem oberen Dnjepr, dem Dnjepr-Donez-Kultur-Komplex und auch mit der Neman-Kultur verbunden. Die Analyse der Form, der Größe und der Konstruktionseigenschaften der Gebäude zeigen sowohl Ähnlichkeiten (Größe bis zu 11 m^2, Tiefe etwa 0,3–0,5 m und die Anwesenheit von rundlichen, steinlosen Feuerstellen) als auch Unterschiede (rechteckige oder ovale Formen für die Kultur von Ost-Polesien, gerundet für die Kultur des oberen Dnjeprs) auf. Zu diesen Grubenhäusern in Belarus finden sich Analogien in der Ukraine und in Litauen. Die Verbreitung der Grubenhäuser markiert eine architektonische Tradition, die sich erheblich von einer zweiten, geografisch gut festgelegten Zone von Grubenhäusern im 4. Jahrtausend v. Chr. in Finnland, Nordwestrussland und der Nordküste Estlands unterscheidet.

Schlüsselwörter: Dnjepr-Donez-Kultur Komplex, Neman-Kultur, Steinzeit , 4. Jahrtausend v. Chr., Grubenhäuser, Wohngebäude, Architektur

Abstract: Fifty-eight Stone Age buildings discovered at 31 settlement sites are currently known in Belarus. Our attention is focused on 21 pit-houses, which are presumably dated to the 4th millennium BC and were found at 13 sites in southern Belarus. They are mainly related to the Eastern Polessye and Upper-Dnieper cultures of the Dnieper-Donets cultural complex, as well as to the Neman culture. Analysis of the shapes, sizes and constructive features of these pit-houses revealed both similarities (size up to 11 m^2, depth ca. 0.3–0.5 m and the presence of rounded fireplaces without stones) and differences (rectangular or oval shapes for the Eastern Polessye culture and rounded for the Upper-Dnieper culture). Analogues of the Belarusian building remains exist on the territories of Ukraine and Lithuania. The distribution of these pit-houses indicates an architectural tradition that differs significantly from the second geographically well-defined pit-house area from the 4th millennium BC, which is located in Finland, north-western Russia and the northern coast of Estonia.

Keywords: Dnieper-Donets cultural complex, Neman culture, Stone Age, 4th millennium BC, pit-houses, dwellings, architecture

Аннотация: В настоящее время в Беларуси известно 58 построек каменного века, открытых на 31 поселении. Наше внимание сосредоточено на 21 углубленной постройке, предположительно датируемой 4-м тысячелетием до н.э., найденной на 13 стоянках в южной Бела-

***Corresponding author: Irina Khrustaleva**, Department of Archaeology, Institute of History and Archaeology, University of Tartu, 18 Ülikooli St., 50090 Tartu, Estonia. E-Mail: irina.khrustaleva@ut.ee. https://orcid.org/0000-0002-2187-8117
Ihar Yazepenka, Department of Archaeology of Prehistoric Society, Institute of History of the National Academy of Sciences of Belarus, vul. Akademičnaja, 1, 220072, Minsk, Belarus. E-Mail: ezep63@yandex.ru. https://orcid.org/0000-0001-5466-1355
Maryia Tkachova, Department of Archaeology of Prehistoric Society, Institute of History of the National Academy of Sciences of Belarus, vul. Akademičnaja, 1, 220072, Minsk, Belarus. E-Mail: tkachova.maryia@gmail.com. https://orcid.org/0000-0002-4247-3370
Elena Kalechits, Department of Archaeology of Prehistoric Society, Institute of History of the National Academy of Sciences of Belarus, vul. Akademičnaja, 1, 220072, Minsk, Belarus. E-Mail: A.Kalechyc@gmail.com
Alexander Kolosov, Chair of History and Philosophy, Faculty of History and philology, Mogilev State A. Kuleshov University, vul. Kosmonavtov, 1, 212022, Mohiliov, Belarus. E-Mail: kolosov_arc@mail.ru. https://orcid.org/0000-0002-4066-232X
Mikola Kryvaltsevich, Department of Archaeology of Prehistoric Society, Institute of History of the National Academy of Sciences of Belarus, vul. Akademičnaja, 1, 220072, Minsk, Belarus. E-Mail: mikola.kryvaltsevich@yandex.by
Aivar Kriiska, Department of Archaeology, Institute of History and Archaeology, University of Tartu, 18 Ülikooli St., 50090 Tartu, Estonia. E-Mail: aivar.kriiska@ut.ee. https://orcid.org/0000-0002-0900-7626

руси. В основном они относятся к Восточнополесской и Верхнеднепровской культурам Днепро-Донецкой культурной общности, а также к Неманской культуре. Анализ форм, размеров и конструктивных особенностей этих построек выявил как сходства (площадь до 11 м², глубина около 0,3–0,5 м и наличие округлых кострищ без камней), так и различия (прямоугольные или овальные формы для Восточнополесской культуры и округлые для Верхнеднепровской) между ними. Остатки построек Беларуси имеют аналоги на территории Украины и Литвы. Расположение этих углубленных жилищ отмечает архитектурную традицию, которая значительно отличается от второй географически четко очерченной области распространения углубленных жилищ 4-го тысячелетия до н.э. в Финляндии, северо-западной России и на северном побережье Эстонии.

Ключевые слова: Днепро-Донецкая культурная общность, Неманская культура, каменный век, 4-е тысячелетие до н.э., углубленные постройки, жилища, архитектура.

Introduction

The study of architecture from the Stone Age in Belarus began in the 1950s, with the discovery of the first remains of a Stone Age dwelling at the Sasonka settlement site by Ivan Artemenko in the Dnieper basin in 1956[1]. The majority of these dwellings were discovered in the 1960s and 1970s through large-scale annual excavations at Stone Age settlements[2]. The study of the Stone Age in Belarus is geographically uneven, with a focus on the eastern and southeastern parts of the country, specifically the Pripyat, Sozh, and Dnieper river basins. As a result, dwelling remains have only been found in these areas (Fig. 1A).

A total of 58 structures, interpreted as buildings by the archaeologists who conducted the excavations, have been discovered at 31 settlement sites in Belarus. These sites, which are listed in Appendix 1, generally date to the period from the final Paleolithic to the end of the Stone Age (approximately the 10th to early 2nd millennium BC). Most of these buildings, as well as the sites themselves, have only typo-chronological dating, and there are few radiocarbon dates. Based on this information, the remains of 22 buildings from 12 sites are attributed to the cultures of the Pre-Pottery Stone Age (around 10.000–5800 BC; see Appendix 1,1–12). Of these, seven were determined to be above-ground buildings (Appendix 1,1–4), and the remaining 15 were identified as pit-houses[3] (Appendix 1,5–12).

Thirty-six buildings from 19 sites belong to the Pottery Stone Age (see Appendix 1,13–31, Fig. 1B for areas of distribution of the archaeological cultures and Fig. 2 for chronology). Two pit-houses are attributed to the Neman culture (Appendix 1,13) and 10 are associated with the Upper-Dnieper culture of the Dnieper-Donets cultural complex (hereinafter DDCC; Appendix 1,14–17). Nineteen buildings from 10 sites are associated with the Eastern Polessye culture of the DDCC, including 10 above-ground buildings (Appendix 1,18–19) and nine pit-houses (Appendix 1,20–27). One pit-house is connected with the Corded Ware culture (Appendix 1,28) and the remains of an above-ground building made of wooden posts have been linked to the North Belarusian culture (Appendix 1,29).

The remains of dwellings were also identified at other Pottery Stone Age sites, but mixed find materials did not enable a clear cultural attribution to be made (Appendix 1,30–31). In general, there are significantly more references to the remains of above-ground structures in the literature than are presented in this study, but we believe these interpretations are not sufficiently justified[4].

Attention in this study is focused on the pit-houses of the 4th millennium BC for two reasons. Firstly, most of the pit-houses excavated in Belarus, i. e. 21 buildings from 13 sites, presumably date to this time (Tab. 1). Secondly, at this time, a number of significant changes, including migrations, occurred in the life of the ancient societies in the forest zone of Eastern and Northern Europe. On the one hand, there was a significant expansion of agricultural groups that spread to southern Scandinavia[5]. On the other hand, population movements by foragers from the forested areas further north and east become visible in the large area from Finland to Belarus as the development of Comb Ware cultures[6]. Since architecture reflects the traditional views of hunter-gatherers, it is important to establish if all these changes somehow impacted the building forms. The focus of our research is to collect and systematise the dataset associated with the pit-house building traditions of the 4th millennium BC in Belarus. All the information about dwellings, which is available in various publications and provides sufficient evidence for distinguishing architectural forms and their periods of use was collected. The data was critically

1 Artemenko 1962, 65–66.

2 Kalechits 1990, 93.

3 Here, a pit-house means all buildings with a sunken floor.

4 E.g. Tyurina 1967, 108; Isaenko 1976, 59; 65–66; Charnyayski/Isaenka 1997, 164.

5 E.g. Solberg 1989, 288; Skoglund *et al.* 2014, 747.

6 E.g. Cherniavskiy 2012, 88–89; Saag *et al.* 2017, 2189; Mittnik *et al.* 2018, 2; Kriiska *et al.* 2020, 105.

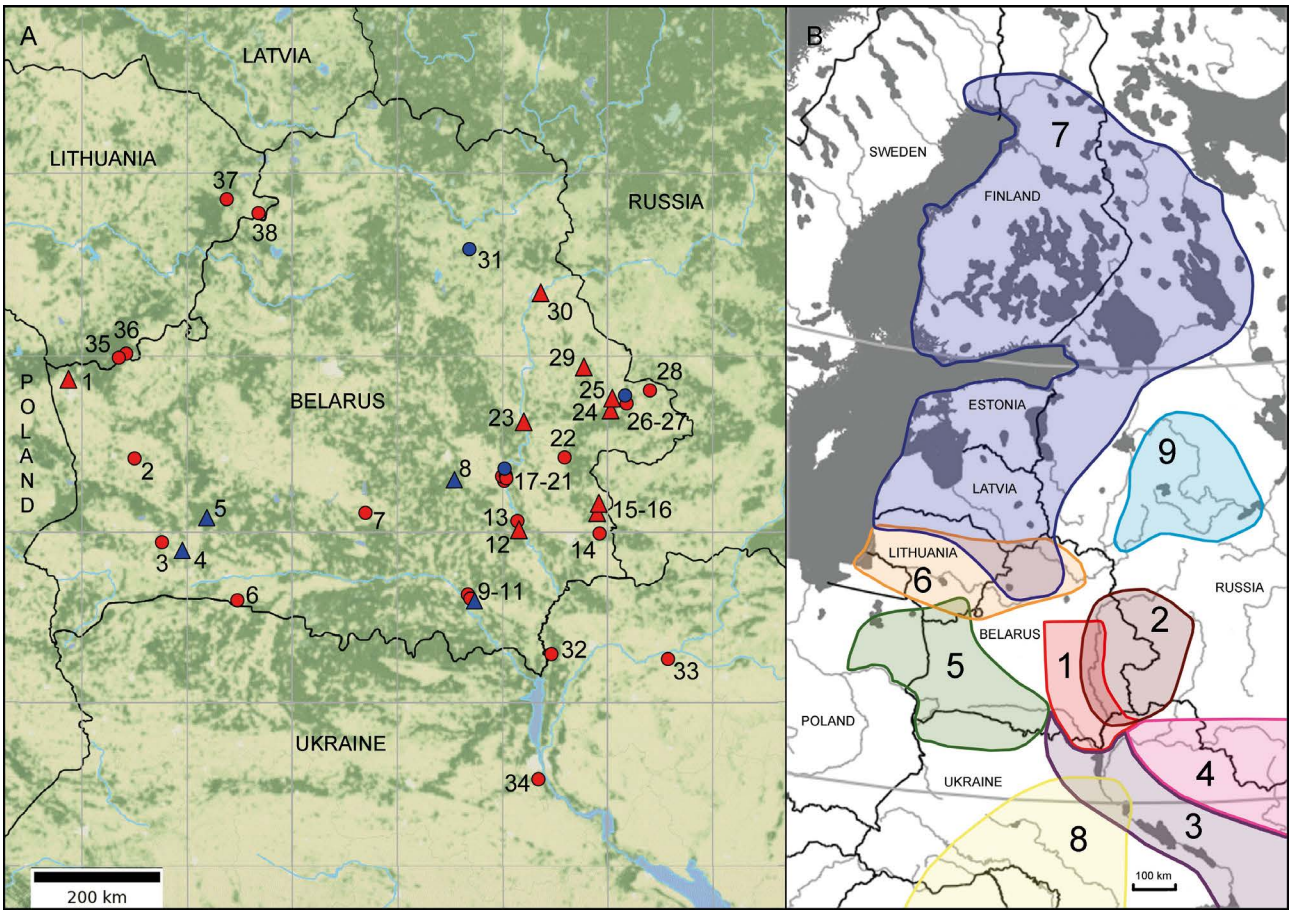


Fig. 1: (A) Map with settlement sites mentioned in the text: triangle – Pre-Pottery Stone Age site, circle – Pottery Stone Age site, red – site with pit-houses, blue – site with above-ground dwellings; 1 – Niamnova 1, 2 – Navasiolki 1, 3 – Pierasudavičy, 4 – Opal II, 5 – Babroviči I, 6 – Vostraŭ III, 7 – Staryja Jurkoviči I, 8 – Stasieŭka, 9 – Juraviči III, 10 – Juraviči IV, 11 – Slabodka I, 12 – Bierahavaja Slabada, 13 – Nižniaja Alba 1, 14 – Dubovy Loh IV, 15 – Novye Gromyki X, 16 – Hlybaŭka III, 17 – Sasonka, 18 – Borok Seminauski, 19 – Prorva 2, 20 – Kamaryn 5, 21 – Kamaryn 5a, 22 – Strumien VI, 23 – Ludčycy, 24 – Kryničnaja, 25 – Vuscie 2, 26 – Rudnia I, 27 – Kamienka 5, 28 – Stary Dziedzin 4, 29 – Dziednia, 30 – Bierascienava, 31 – Asaviec 7, 32 – Mnevo-Les (Pustyn'ki 5), 33 – Hryshivka, 34 – Vita Litovskaya, 35 – Katra 2, 36 – Paramėlis 2, 37 – Pakretuonė 3, 38 – Žeimenis I; and (B) the main archaeological cultures of the 4th millennium BC: 1 – Eastern Polessye, 2 – Upper-Dnieper, 3 – Kyiv-Cherkasy, 4 – Lisogubovskaya, (1–4 – cultures of the Dnieper-Donets cultural complex), 5 – Neman, 6 – Narva, 7 – Comb Ware, 8 – Trypillia, 9 – Valdai. After: Charnyauski 2004: 151; 2011, Fig. 51; Kryvaltsevich 2009, 26; Nogin 2016, Fig. 266; 267; Kriiska *et al*. 2020, Fig. 17; 25; Girininkas 2009, Fig. 87; 119; 122; Tkachov 2017, Fig. 1.

reviewed, and some pit-houses were radiocarbon dated in the course of this study. This made available the first comprehensive view of a relatively large group of Stone Age architectural remains, which in comparison with contemporary data from neighbouring territories, provides new perspectives for understanding the traditions of dwelling construction in the European forest zone.

Sites with remains of pit-houses of the 4th millennium BC

In total, we collected data on 19 pit-houses from twelve DDCC settlement sites (eight Eastern Polessye and three Upper-Dnieper culture sites) and two pit-houses from a Neman culture settlement site (Fig. 1). All these settlements are located on sandy hills in river floodplains or on lakeshores (Fig. 3). The stratigraphy of the sites is generally similar, i. e. turf and humus with an average thickness of up to 0.5 m overlays grey podzol (or grey-yellow sand that usually lightens downwards, or light brown sandy loam), which is up to 0.7 m thick on average, and is followed by a base layer, mostly represented by light yellow or whitish fine-grained sand. All the sites include archaeological material from various periods contained in the same stratigraphic unit and can only be separated based on the pottery types. Pit-houses appeared only as sunken floors at the level of the base layer and, in almost all cases, their depth was measured from this level.

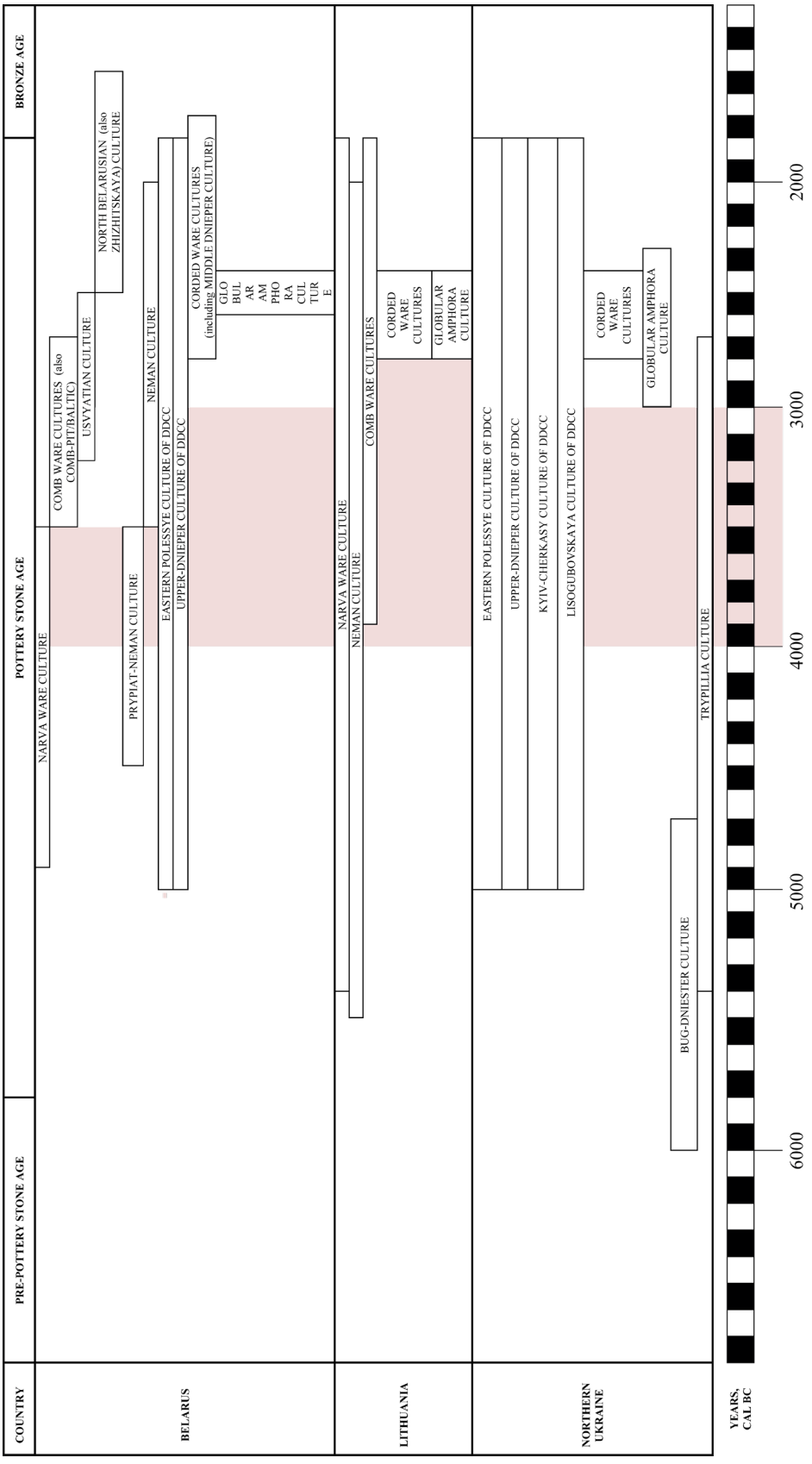


Fig. 2: Chronology of the main archaeological cultures in Belarus, Lithuania and northern Ukraine, including those mentioned in the text. Pink colour marks the study period. After: Cherniavskij 2004; Yazepenka 2014: 56–58; Charniauski 2014; 2016; Chernyavskiy2012; Cherniavskij 2014; Kurzyk 2014; Piličiauskas 2018; Kriiska *et al.* 2020, Fig. 1; Rassamakin 2012; Gaskevich 2014.

Fig. 3: Staryja Jurkovičy I – 2018, view of the site located on a sandy lakeshore. Photo: M. Kryvaltsevich.

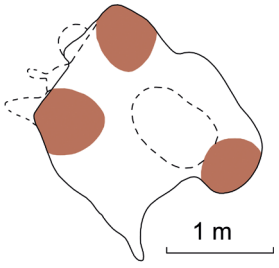
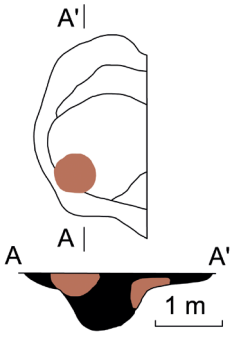
The sites were mainly excavated based on technical layers of varying thickness, and the excavation methods often did not include any accurate three-dimensional documentation of the finds, which were collected from squares of 1 x 1 m^2 or 2 x 2 m^2 in size. The pits and features of the cultural layer were excavated and documented separately[7]. Therefore, a spatial analysis of objects at the settlement sites is not possible, and the focus is rather on describing the building remains, highlighting their architectural features and clarifying their dating. The dates presented in this article were calibrated using the OxCal 4.4.4 programme[8] with the IntCal 20 atmospheric curve[9] and are given here with a 95.4 % probability.

Eastern Polessye culture of the DDCC

Kamaryn 5 settlement site is located in the left-bank floodplain of the Dnieper River (Fig. 1A). The site was discovered in 1995 and excavated (ca. 180 m^2) in 1998, 2005–2007 and 2011 (Ihar Yazepenka and Aliaksandr Rykunou). The remains of a Stone Age pit-house, two household pits and two burials were revealed at the site[10].

The pit-house had a trapezoidal shape with a length of 2.1 m, and a width of 1.8 m (Tab. 1,1). The filling consisted of fine-grained dark grey or black sand (Fig. 4) and its depth

Tab. 1: Pit-houses of the 4th millennium BC in Belarus.

No	Site	Archaeological Culture	House plan (brown color marks fireplaces)	Size (m) (length × width × depth)	Date (^{14}C) and sample	Calibrated date (95.4 %)	Reference
1	Kamaryn 5	Eastern Polessye (DDCC)		2.1 × 1.8 × 0.3	Organic sediments from a fireplace: 4780±90 BP (Ki-15033)	3758–3363 calBC	Drawing: Ezepenko 2016, 286. Date: Ezepenko 2016, 281.
2	Prorva 2	Eastern Polessye (DDCC)	 1	3.2 × 1.7 × 0.86	Organic crust from a potsherd: 4650±35 BP (Poz-151609)	3516–3365 calBC	Drawing: Yazepenka 2014, 156. Date: this study

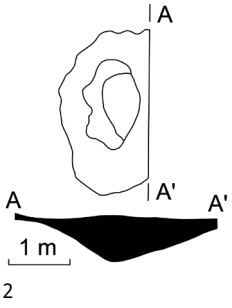
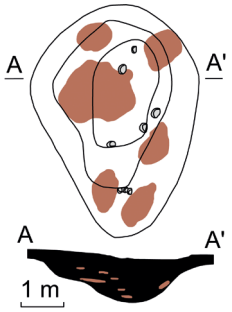
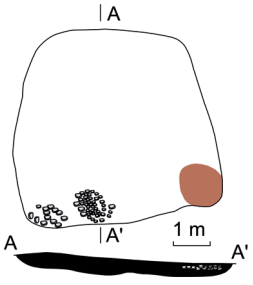
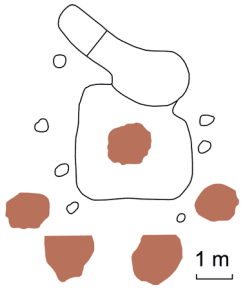
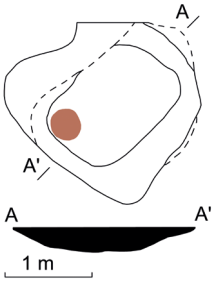
7 E.g. Kalechits 1977, 10; 1978, 20; Kryvaltsevich 1986, 5.

8 Bronk Ramsey 2021.

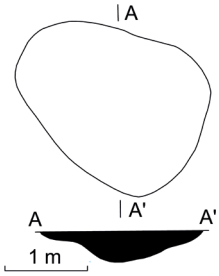
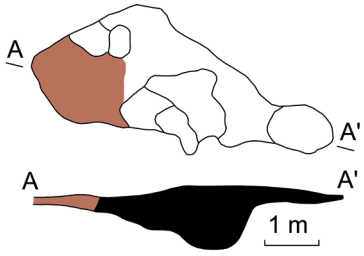
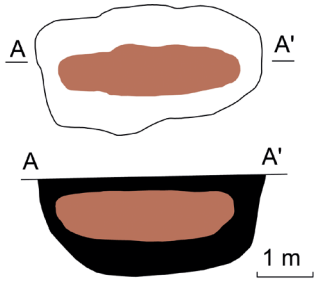
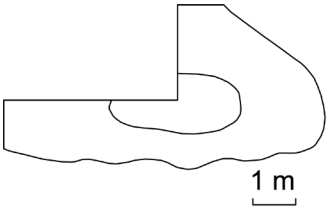
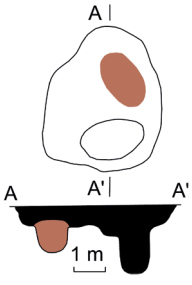
9 Reimer *et al.* 2020.

10 Yazepenka 2007; Ezepenko 2016.

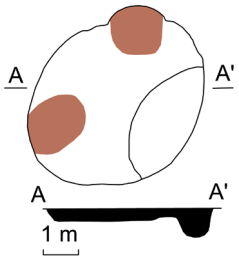
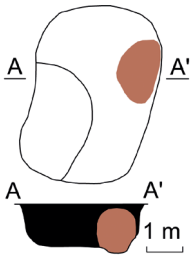
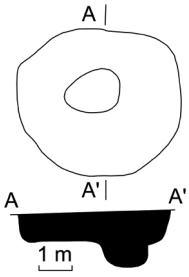
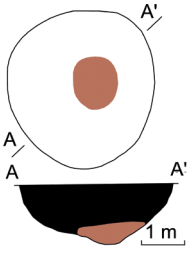
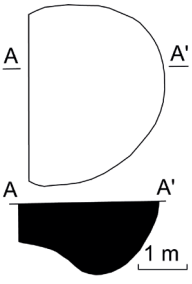
Tab. 1 (continued)

No	Site	Archaeological Culture	House plan (brown color marks fireplaces)	Size (m) (length × width × depth)	Date (^{14}C) and sample	Calibrated date (95.4 %)	Reference
3	Prorva 2	Eastern Polessye (DDCC)	 2	3 × ? × 0.7	Datable material not found		Drawing: Yazepenka 2014, 156.
4	Juravičy III	Eastern Polessye (DDCC)		5 × 3.4 × 0.7	Charcoal: 250±30 BP (Poz-133571)	1500–1800 calAD	Drawing: Isaenko 1963. Date: this study
5	Juravičy IV	Eastern Polessye (DDCC)		4.6 × 4.8 × 0.2/0.3	Datable material not found		Drawing: Isaenko 1967, 73.
6	Sasonka	Eastern Polessye (DDCC)		3.4 × 2.4 × 0.2/0.3	Datable material not found		Drawing: Yazepenka 1995, 63.
7	Nižniaja Alba 1	Eastern Polessye (DDCC)		1.6 × 2.1 × 0.3	Charcoal: 4250±60 BP (Лу-10472), 4360±40 BP (Poz-133429)	3500–3029 calBC, 3093–2898 calBC	Drawing: Yazepenka/ Yuretsky, 2013, 324. Date: Ezepenko 2016, 281–282; this study

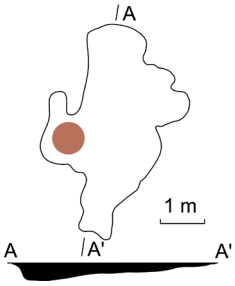
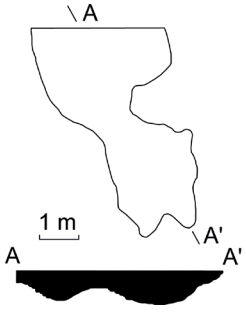
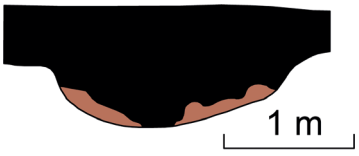
Tab. 1 (continued)

No	Site	Archaeological Culture	House plan (brown color marks fireplaces)	Size (m) (length × width × depth)	Date (^{14}C) and sample	Calibrated date (95.4 %)	Reference
8	Borok Seminauski	Eastern Polessye (DDCC)		2.3 × 2 × 0.5	Horse tooth: modern time		Drawing: Yazepenka 2006, Fig. 3. Date: this study
9	Staryja Jurkovičy I	Eastern Polessye (DDCC)		3.1 × 1.5 × 1	Charcoal: 4430±40 BP (Poz-133187)	3330–2920 calBC	Drawing: Kryvaltsevich 1986, Fig. 7. Date: this study
10	Strumien VI (also Loša I)	Upper-Dnieper (DDCC)		4 × 2 × 0.6	Datable material not found		Drawing: Kalechits 1976, 20.
11	Strumien VI (also Loša II)	Upper-Dnieper (DDCC)	 1	4 × 6 × 0.5	Datable material not found		Drawing: Kalechits 1980, Fig. 1.
12	Strumien VI (also Loša II)	Upper-Dnieper (DDCC)	 2	3.8 × 3.8 × 0.4	Datable material not found		Drawing: Kalechits 1980, 33.

Tab. 1 (continued)

No	Site	Archaeological Culture	House plan (brown color marks fireplaces)	Size (m) (length × width × depth)	Date (^{14}C) and sample	Calibrated date (95.4 %)	Reference
13	Strumien VI (also Loša II)	Upper-Dnieper (DDCC)	 3	3.8 × 3.5 × 0.4	Datable material not found		Drawing: Kalechits 1980, 33.
14	Strumien VI (also Loša II)	Upper-Dnieper (DDCC)	 4	2.3 × 2.5 × 0.5/0.8	Datable material not found		Drawing: Kalechits 1980, 33.
15	Strumien VI (also Loša II)	Upper-Dnieper (DDCC)	 5	3.5 × 3 × 0.5	Datable material not found		Drawing: Kalechits 1980, 33.
16	Dubovy Loh IV	Upper-Dnieper (DDCC)	 1	2.2 × 2.2 × 0.4	Datable material not found		Drawing: Kalechits 1987, 41.
17	Dubovy Loh IV	Upper-Dnieper (DDCC)	 2	3 × 2.6+ × 0.5	Datable material not found		Drawing: Kalechits 1987, 41.

Tab. 1 (continued)

No	Site	Archaeological Culture	House plan (brown color marks fireplaces)	Size (m) (length × width × depth)	Date (^{14}C) and sample	Calibrated date (95.4 %)	Reference
18	Rudnia I	Upper-Dnieper (DDCC)		2.5 × 3.5 × 0.2/0.5	Burnt bone: 8560±50 BP (Poz-150691)	7713–7518 calBC	Drawing: Kolosov 2009a, Fig. 13. Date: this study
19	Stary Dziedzin 4	Upper-Dnieper (DDCC)		4.8 × 2/3.4 × 0.6/0.8	Datable material not found		Drawing: Kolosov 2013, Fig. 13.
20	Pierasu-daviči	Neman	 1	1.8/2.5 × ? × 0.4	Datable material not found		Drawing: Isaenko 1963, 12.
21	Pierasu-daviči	Neman	 2	4.6/4.8 × ? × 0.3/0.4	Datable material not found		Drawing: Isaenko 1963, 12.

in the western part of the dwelling was up to 0.3 m, but in the deepest northern part 0.4 m from the level of the base layer. Fireplaces were identified in three corners, and an entrance, apparently, was located on the southern side[11]. Inside, 17 flint flakes and 60 fragments of the Eastern Polessye culture pottery were found, as well as small fragments of burnt bones and charcoal pieces. The date 3760–3360 calBC (Tab. 1,1) was obtained from soil in one of the fireplaces.

Prorva 2 settlement site is located in the left-bank floodplain of the Dnieper River (Fig. 1A). It was discovered in 1994 (I. Yazepenka, Mikola Kryvaltsevich & A. Rykunou), and excavations (341 m^2) took place in 1995–1996 and 1998[12]. A series of Stone Age pits was discovered, two of which (partly excavated) were interpreted as dwellings, and two burials of the Middle-Dnieper culture were also excavated at the site[13]. The dates obtained from organic crust on the Eastern Polessye culture pottery shows on average the use of the site in the period 3500–2200 calBC (not taking into account the possible reservoir effect), but the dwellings themselves had no dates before our research[14].

Dwelling 1 stands out with the largest find number of at least 140 objects. The pit had an oval shape and dimensions of 3.2 × 1.7 m, the deepest point of the filling was 0.86 m below the level of the base layer (Tab. 1,2). In the southern part of the dwelling there was a roundish spot of a fireplace

11 Ezepenko/Voronenko 2017.
12 Yazepenka 2014, 31.
13 Ibid. 33; 79.
14 Ibid. Tab. 3,2; 2016, 281–283.

Fig. 4: Kamaryn 5, 2006. Upper part of the pit-house at the level of the base layer. Photo: I. Yazepenka.

of light grey colour with small charcoal pieces, while the rest of the filling had a mixed dark colour. Finds from the pit-house are represented by flint artefacts, 106 fragments of Eastern Polessye culture vessel (found in the central part), and eight fragments of early Bronze Age pottery. An Eastern Polessye culture potsherd with organic crust on the surface from the filling of the pit-house was sampled for dating and gave an age 3520–3370 calBC (Tab. 1,2).

Supposed dwelling 2 had an elongated oval shape (Tab. 1,3). The filling of the pit was humified sand of dark grey colour with lighter inclusions of grey-yellow sand. The maximum length of the pit was 3 m, and the depth in the central part was 0.7 m from the level of the base layer. Inside the house, 85 fragments of Eastern Polessye culture pottery and 21 flint artefacts, mostly flakes, were found.

Juravičy III settlement site is located on the south-western shore of Litvin Lake at the source of the Zakota River (Fig. 1A). It was discovered in 1962 and excavations (180 m^2) were carried out in 1962–1963 (Vladimir Isaenko)[15]. The remains of a building in the form of an oval pit oriented north-south were discovered at the site. Its dimensions were 3.6 × 2.7 m at the depth of 0.7 m from the surface, and at the bottom, at a depth of 1 m – 2.3 × 1.5 m (Tab. 1,4). Thus, the dimensions of the dwelling in the upper part were presumably 5 × 3.4 m and its depth 0.7 m[16]. The floor of the dwelling gradually descended from the south and west sides towards the centre. The supposed entrance to the building was from the south and had a width of 1.1 m. Several burnt stones and an ash-charcoal spot were found inside. The filling of the building contained grey and brown hard soil with charcoal pieces and ash, as well as flint artefacts and fragments of pottery. Finds and charcoal-rich layers marked the floor level of the pit-house[17]. Perhaps the dwelling had a light roof and a central support post[18]. According to the pottery fragments, the site is attributed to the late stage of the Eastern Polessye culture. However, the date 1500–1800 calAD (Tab. 1,4) obtained from a charcoal piece from the pit-house indicates later disturbances in the cultural layer.

Juravičy IV settlement site is located on the eastern shore of Litvin Lake, 200 m north of the Juravičy III site (Fig. 1A). It was discovered in 1962 and excavated (568 m^2)

15 Isaenko 1963; 1976, 85.

16 Isaenko 1967, 54.

17 Ibid. 52–54; 1976, 86.

18 Isaenko 1967, 54.

in 1964–1966[19]. The remains of a Stone Age pit-house and two hearths lined with stones were discovered at the site[20].

A rectangular pit-house measuring 4.6 × 4.8 m was deepened 0.2–0.4 m into the ground (Tab. 1,5). In the south-eastern corner was a hearth made of small stones. Another fireplace without stones was located in the north-eastern corner. The western part of the floor was raised ca. 0.2 m[21]. The exact composition and number of finds from the pit-house is unknown, but according to potsherds the site is attributed to the late stage of the Eastern Polessye culture.

Sasonka settlement site is located on the right-bank floodplain of the Dnieper River (Fig. 1A). It was found in 1956 and excavated (295 m^2) in 1956–1957 (I. Artemenko) and 1993 (I. Yazepenka). A total of 391 m^2 were investigated, and the remains of a Stone Age pit-house and four fireplaces were uncovered[22].

The pit-house had a rectangular shape, dimensions of 3.4 × 2.4 m and a depth of 0.2–0.3 m (Tab. 1,6). In the centre, a round fireplace 1 m in diameter and 0.2 m deep was found, and in the northern part there was a 'corridor'-like entrance 4.2 m long and 1.3–1.5 m wide[23]. A concentration of ash was located at the entrance, next to which about 60 flint artefacts were found. Outside, along the perimeter of the building, there were seven post holes with a diameter of 0.25–0.3 m and a depth of 0.2–0.3 m. The posts were apparently dug in and stood slantly towards the centre of the building, their ends were pointed[24]. At a distance of 1.2 m from the beginning of the entrance, a step of 0.2 m was made, and after that the even floor was deepened in the base layer by 0.45–0.5 m. Thirty flint artefacts, mainly flakes, and 12 fragments of Eastern Polessye culture pottery were found near the fireplace[25]. Four other fireplaces with a diameter of 1 to 1.6 m and a depth of 0.3 to 0.4 m were located in a semicircle south of the pit-house. They contained black sand and flint artefacts and the Eastern Polessye culture potsherds were found around them.

Nižniaja Alba 1 settlement site is located on a terrace of the Dnieper River (Fig. 1A). This site may have been mentioned as early as 1925 (Konstantin Polikarpovich) when flint artefacts were found there. In 2011–2013, new research was carried out at the site (I. Yazepenka) and the remains of a Stone Age pit-house, three (household) pits and the remains of a dwelling from the 14th–15th centuries were found[26].

The pit-house was represented by a black-grey patch of irregular oval shape, oriented north-east to south-west and measuring 1.6 × 2.1 m (Tab. 1,7). The maximum depth of the pit-house in its central part was 0.3 m. In the south-western part there was a fireplace, represented by a 0.3 × 0.4 m spot with a light grey filling and charcoal pieces up to 0.4 m thick. Inside the pit-house, mainly in its central part around the fireplace, eight flint artefacts, 43 Eastern Polessye culture potsherds and a fragment of a burnt bone were found. Two dates were obtained from charcoal pieces from the fireplace inside the building, giving it an age of 3500–3029 calBC and 3093–2898 calBC (Tab. 1:7).

Borok Seminauski settlement site is located on the left bank of the Dnieper River (Fig. 1A). Excavations (293 m^2) were conducted in 1957–1958[27] and in 2000–2001 (I. Yazepenka), when possible remains of a Stone Age building were found at the site[28].

An oval pit measuring 2.3 × 2 m (Tab. 1,8) was filled with black-grey, sometimes black fine-grained sand, and its maximum depth in the central part reached 0.46 m. In the pit 37 flint artefacts, mainly flakes, 79 Eastern Polessye culture potsherds, 31 fragments of early Bronze Age vessels and burnt bones were found. An unburnt horse tooth (Equus sp., identification by Eve Rannamäe, June 2020) was also found in the lower part of the pit fil, but dated to modern times. This indicates the mixing of objects already noted in previous studies of the site[29].

Staryja Jurkovičy I settlement site is located on the right bank of the Aresa River (Fig. 1A and 3). It was discovered in 1980 and excavated (688 m^2) in 1985–1987 (M. Kryvaltsevich). It is a multi-period settlement site with objects and features of various functions (burials, dwellings, traces of household buildings, etc.) from the Stone, Bronze, Iron and Middle Ages.

The Stone Age pit-house found at the site was visible as an oval pit stretching from west to east, 3.1 × 1.45 m in size and 0.95 m deep[30] (Tab. 1,9; Fig. 5). Most of the pit was filled with dark grey sandy soil, brown in places with charcoal pieces. The filling in the western corner was black and mixed with a large amount of small charcoal pieces, probably indicating the presence of a fireplace. The central part of the pit-house had several small pits at the floor. Fragments of two ornamented Eastern Polessye culture pots (32 pieces), about 50 fragments of other vessels of the same culture, about 90 flint artefacts and some fragments of burnt bones

19 Isaenko 1976, 86.
20 Isaenko 1997, 135–136.
21 Isaenko 1976, 86–87.
22 Artemenko 1964; Yazepenka 1995; 2014, 23–26.
23 Artemenko 1964, 115.
24 Ibid. 111.
25 Yazepenka 2014, 24.
26 Yazepenka/Yuretski 2013; Ezepenko 2016, 281–282.
27 Artemenko 1957; 1958.
28 Yazepenka 2006, 20.
29 Kalechits 1987, 40.
30 Kryvaltsevich 1986; 1987; 2010.

Fig. 5: Staryja Jurkovičy I, 1985, sunken floor of the pit-house with small pits. Photo: M. Kryvaltsevich.

were found inside the building[31]. The date 3330–2920 calBC was obtained from a charcoal piece found in the pit-house (Tab. 1,9).

Upper-Dnieper culture of the DDCC

Strumien VI settlement site is located on the left bank of the Sozh River (Fig. 1A) and was discovered in 1927 (K. Polikarpovich). Extensive surface collecting took place here in 1975–1976 (Elena Kalechits), and as a result of many years of field work, two areas were investigated: the higher part of the butte (Loša I) and its lower part (Loša II). Excavations (620 m^2) at the higher part were carried out in 1976–1977 and the remains of a Stone Age pit-house and three Bronze Age buildings, 19 household pits, 15 fireplaces, as well as three inhumations of the Middle-Dnieper culture were identified there[32].

The pit-house was preserved as an oval spot measuring 4 × 2 m and with a dark grey filling (Tab. 1,10). A patch of ash observed in the upper part of the fill was presumably not synchronous with the building[33]. The pit-house was about 0.6 m deep and had a concave floor profile. Flint artefacts and 11 Upper-Dnieper culture potsherds were found inside[34]. The house can be dated to the late stage of the Upper-Dnieper culture.

The lower part was excavated (2332 m^2) from 1976 to 1983 and five Stone Age pit-houses, 37 fireplaces of various shapes and sizes and 42 household pits were discovered there[35]. All buildings had concave floor profiles identified by the bottom level of finds[36]. They can be dated to the late stage of the Upper-Dnieper culture.

Pit-house 1 was only partially excavated as part of it was destroyed by a trench. It was oval with dimensions of 4 × 6 m and had uneven edges (Tab. 1,11). The central part

31 Kryvaltsevich 1986.

32 Kalechits 1975, 55–56; 1976, 19–36; 1977, 15–16; 1978, 20–34; 1987, 61; 1997, 178.

33 Kalechits 1987, 63.

34 Kalechits 1976, 32–33; 1987, 61–63.

35 Kalechits 1977, 17–27; 1978, 34–40; 1980, 35–52; 1983, 1–24; 1987, 68.

36 Kalechyc 1997, 179–180.

Fig. 6: Strumien VI (Loša II), 1977, sunken floor of the pit-house 2 at the base-layer level. Kalechits 1977, Fig. 45.

had a disturbance filled with light yellow sand. No fireplace was found, but there were many small charcoal pieces in the house. The floor was deepened by 0.6 m and had a noticeable slope towards the river. Inside, 37 Upper-Dnieper culture potsherds and 23 flint artefacts, mostly flakes, were found[37].

Pit-house 2 consisted of a dark grey spot of almost round shape, 3.8 × 3.6 m in size and 0.4 m deep (Tab. 1,12; Fig. 6). In the eastern part, a fireplace measuring 1.8 × 0.5 m was discovered, sunk 0.5 m into the floor of the dwelling and filled with sandy ash. Nearby, also in the floor, was a round pit, up to 1 m deep and 0.8 m in diameter. Inside the pit-house, 68 fragments of the Upper-Dnieper culture pottery and 46 flint artefacts were found.

Pit-house 3 was almost circular in shape, measuring 3.8 × 3.5 m, with two fireplaces (one of which was younger than Stone Age) and a pit inside (Tab. 1,13). It was visible due to the dark coloured sandy loam in the filling. The finds were concentrated at a depth of 0.6 m and marked the floor level. The fireplace (0.7 × 1 m) was sunk into the floor and located near the northern wall of the pit-house. Its intensely coloured sandy ash fill reached a depth of 0.85 m. A deep (up to 0.95 m) and narrow (up to 0.5 m) pit had been dug near the western wall of the pit-house. Inside the building, 105 flint artefacts and 11 fragments of the Upper-Dnieper culture pottery were found.

Pit-house 4 was round, 2.3 × 2.5 m in size, 0.5–0.8 m deep (Tab. 1,14) and had an uneven floor. It had been disturbed by the digging of a later pit that had created a 'belt' of pure white sand between the dwellings 3 and 4. Beside the western wall was a fireplace represented by a round spot of sandy ash 0.5 m in diameter and sunk into the floor of the dwelling by 0.2 m. Eleven Upper-Dnieper culture potsherds and 10 flint artefacts were found inside the pit-house.

Pit-house 5 had an almost circular floor plan, measured 3.5 × 3 m and was 0.5 m deep (Tab. 1,15). The fireplace in the centre was poorly visible with a lightly coloured burnt sandy loam in the filling. The fill of the dwelling contained charcoal pieces. A deep (up to 1.4 m) pit was located next to the north-western wall. Inside the pit-house, 239 flint artefacts, mainly flakes, 18 fragments of the Upper-Dnieper culture pottery and four stones were found.

Dubovy Loh IV settlement site is located in the right-bank floodplain of the Iput River, a left tributary of the Sozh River (Fig. 1A). It was discovered in 1979 and excavated in 1980–1983 (168 m^2; E. Kalechits). The remains of two round Stone Age pit-houses, fireplaces and household pits were uncovered here[38]. The finds of the settlement site are attributed to the early stage of the Upper-Dnieper culture.

Pit-house 1 was 2.2 m in diameter and 0.4 m deep (Tab. 1:16). The profile of the floor was concave and uneven. A fireplace of about 0.8 × 1 m in size and nine flint artefacts were found in the central part of the dwelling[39].

Pit-house 2 was partially excavated, 3 m in diameter and 0.5 m deep (Tab. 1:17) and the entire filling was mixed with small charcoal pieces. The floor was uneven and inclined sharply to the north (depth from 0.1 to 0.5 m)[40]. Flint artefacts and fragments of Upper-Dnieper culture vessels were found inside the pit-house. A concentration of finds around the pit-houses was also noticed[41].

Rudnia I settlement site is located on the left bank of the Sozh River (Fig. 1A). It was discovered in 1994 (Vyacheslav Kopytin) and excavated (350 m^2) in 2006–2008 (Alexander Kolosov). The remains of a Stone Age pit-house and a pit were found at the site[42]. Mechanical mixing of find material was observed during the excavations, as evidenced by a similar vertical distribution of finds from the Final Paleolithic (12th–10th millennia BC) to the 17th–18th centuries AD[43]. However, at least a complex of Stone Age pottery in the filling of the dwelling seems lying *in situ*.

The remains of the pit-house had an irregular shape and measured 2.5 × 3.5 m (Tab. 1,18; Fig. 7). In the southern part, its depth was 0.18–0.2 m, in the west and north – 0.49–0.51 m. The entrance was from the south, where a small 'corridor' was found. The pit-house was elongated from north to south and had a concave floor profile. Its

37 Kalechits 1987, 68–69.

38 Kalechits 1979, 63–64; 1982, 1–17; 1987, 41–42.
39 Kalechits 1987, 42; 1990, 97.
40 Kalechits 1987, 42; 1990, 97.
41 Kalechyc 1997, 172.
42 Kolosov 2009a; 2009b, 58–72.
43 Ibid. 12–15.

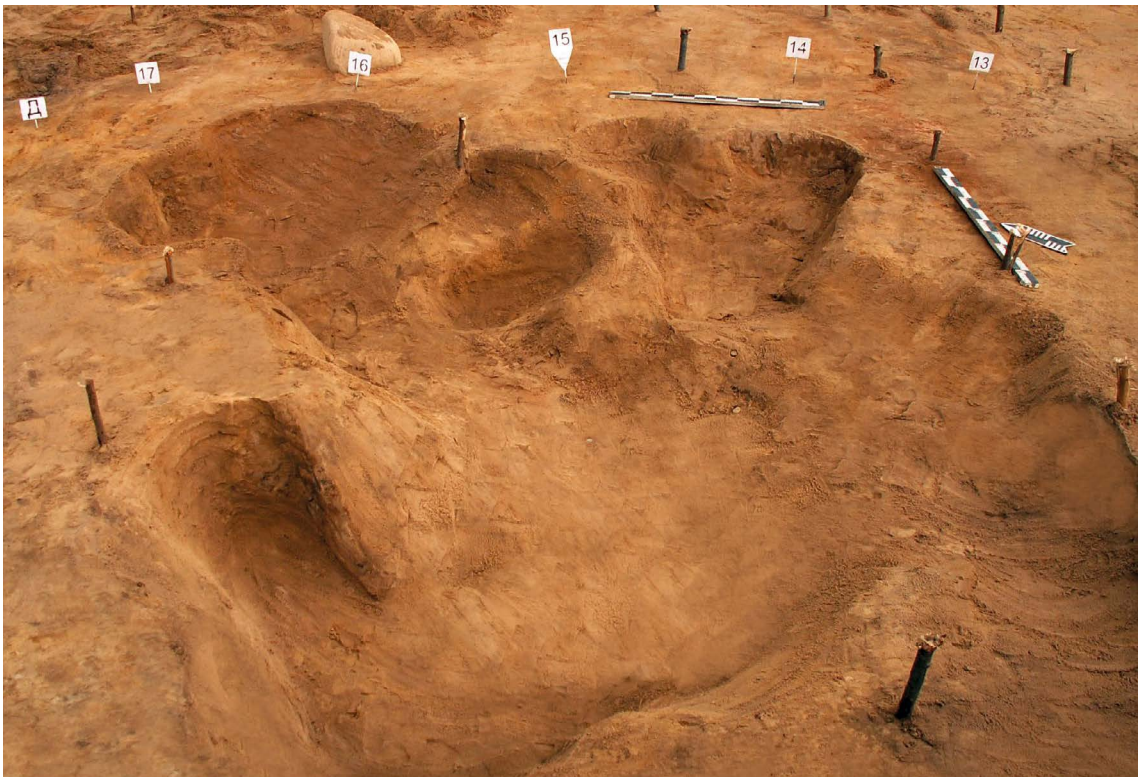


Fig. 7: Rudnia I, 2008, sunken floor of the pit-house with irregular shape at the base-layer level. Photo: A. Kolosov.

filling contained grey or dark grey sand, and the fireplace was probably in the western part, where the fill was darkest and included charcoal pieces. A total of 988 artefacts were found inside the pit-house, almost all concentrated in the central part: flint artefacts (mainly flakes), 59 Upper-Dnieper culture potsherds and 100 fragments of burnt bones[44]. The date 7713–7518 calBC (Tab. 1,18) was obtained from a fragment of a burnt elk bone (identification by Eve Rannamäe, March 2022). This must probably shows that the floor of the Upper-Dnieper culture pit-house cut through an earlier cultural layers.

Stary Dziedzin 4 settlement site is located on the left bank of the Oster River, a left tributary of the Sozh River (Fig. 1A). It was discovered in 2006 (A. Kolosov and Mikhail Duktov) and field works (232 m^2) were carried out in 2006, 2010 and 2012[45]. Remains of Stone Age structures were found at the site: a supposed pit-house, a fireplace and four pits of different shapes and sizes. The pit-house had an irregular eight-shaped floor plan, was oriented from south-east to north-west and was 4.8 × 2/3.4 m in size (Tab. 1,19). The filling consisted of dark grey sand 0.6–0.8 m thick and its bottom had a concave profile. The supposed 'corridor' connected to the entrance of the dwelling could face south-east. The filling of the pit-house contained 164 flint artefacts, 131 fragments of the Upper-Dnieper culture pottery and three Bronze Age potsherds. Most of items, especially pottery, were concentrated in the south-eastern part and attributed to the late stage of the Upper-Dnieper culture[46].

Neman culture

Pierasudavičy settlement site is located on the southern shore of Beloe Lake (Fig. 1A). It was discovered in 1963 (V. Isaenko) in trenches dug by bulldozers through the settlement area. The remains of two pit-houses were found and their bottom levels were indicated by the distribution of finds[47].

Pit-house 1 was 1.8–2.5 m long and dug 0.4 m into the base layer. A fireplace was unearthed at its bottom (Tab. 1,20). Flint artefacts and the Neman culture pottery were found in the filling of the dwelling and adjacent to it. Pit-house 2 with a length of 4.6–4.8 m was deepened 0.3–0.4 m into the base layer (Tab. 1,21). Its southern part contained charcoal pieces

44 Kolosov 2009a, 11–12.
45 Kolosov 2009b, 38; 120.
46 Kolosov 2019, 46–48.
47 Isaenko 1963, 9–11.

and the pit-house was filled with grey soil mixed with ash. Flint artefacts and fragments of pottery were found in it. Both pit-houses probably had an oval shape and are attributed to the late stage of the Neman culture[48].

Methods and results

We collected data on 21 pit-houses from 13 Stone Age settlement sites in Belarus, which were attributed to the 'late Neolithic' by researchers, and which, according to our understanding of the chronology, could be dated to the 4th millennium BC. Since pottery is the main typo-chronological marker here, found inside the pit-houses it did allow for a more precise determination of their chronological and cultural affiliations. It became clear that all the pit-houses were found at sites located primarily in the southern part of Belarus and can be correlated with three archaeological cultures, i. e. the Eastern Polessye, the Upper-Dnieper and the Neman.

The radiocarbon dating of the pit-houses was our next task. However, this was problematic as the organic materials are poorly preserved in the mineral soils, and had rarely been collected from older excavations. Yet, six new dates, in addition to the four that were previously obtained, completed our typo-chronological conclusions, and in three cases, helped to reveal disturbances in the cultural layer. Samples of charcoal pieces, animal tooth and burnt bone, as well as the organic crust from a potsherd were dated using accelerator mass spectrometry (AMS) at the Poznań Radiocarbon Laboratory (Poz). The results enable us to determine that, although the chronological framework of DDCC is wide and reaches as far back as the second millennium BC, on average, the dates for the pit-houses cover the period from 3500 to 2900 calBC. This suggests that the rest of the DDCC pit-houses with the same types of pottery also belong to the 4th millennium BC or the early 3rd millennium BC. Neman culture pit-houses do not have radiocarbon dates, but the pottery from their filling is typo-chronologically comparable to the DDCC data.

In order to study the remains of the pit-houses, typological and comparative analyses were primarily used, i. e. classifications related to the differences and similarities of the dwelling shapes, sizes and depths were applied. Whenever possible, all the preserved features of the building structures were also analysed. These included post holes, floor profiles, the existence and location of fireplaces, their shapes and structure (e. g. the presence or absence of stones), as well as the locations of the entrances and concentration of the finds.

Thereby, it became clear that the pit-houses of the Eastern Polessye culture seem to have two basic forms. Of the nine buildings discussed herein, four were close to rectangular in shape, and quite small, i. e. about 2–2.5 m long. Only one building in Juravičy IV was larger (Tab. 1). All these pit-houses were only dug ca. 0.3 m into the base layer. The shape of another five buildings associated with this culture were mainly oval and sunken deeper, ca. 0.5 to 1 m into the base layer. The dimensions of the oval pit-houses were also relatively small, and the lengths rarely exceeded 3 to 3.5 m. The floors of oval pit-houses were uneven, with stepped or concave profiles. There were also various pits, and only the floors of the rectangular buildings can be described as being relatively flat. Roundish patches of ash or charcoal were discovered in almost all the buildings with the exception of the structure at Borok Seminauski. In some cases, they were dug deeper and had clear outlines. In others, the outlines were less clear, and sometimes, there were individual fragments of charcoal in the filling of the pit-houses. It can be assumed that the fireplaces were not constructed of stone (Juravičy III and IV may be exceptions, as stones were found there, although their connection to the fireplaces has not been reliably established). Most of the fireplaces were located near the walls of the dwellings. The irregular shapes of the pit-houses suggest that they were based on a post construction. This could only be confirmed at Sasonka, where seven post holes were examined around the pit-house.

The pit-houses of the Upper-Dnieper culture were mainly rounded and small in size, with their average diameters ranging from 3 m to 3.5 m. The only exceptions were the elongated oval pit-house 1 at Strumen VI (Loša II) and the irregular building at Rudnia I. The pit-houses mainly had concave floors and were deepened ca. 0.4–0.5 m into the base layer. Most of them contained traces of small circular fireplaces, visible as pits or spots with a filling that was rich in ashes or charcoal, but without stone or other construction. The remains of the vertical structures of these dwellings were not discovered. However, some of the pits found at the bottoms of the pit-houses and the shape of the buildings at Kamaryn 5, Staryja Jurkovičy I, Strumien VI and Rudnia I indicate that they may have had a post structure (Tab. 1)[49].

The buildings of the Neman culture provide the least data, and their actual sizes and shapes are unknown. It is only known that the floors in these pit-houses had concave profiles, and were sunken 0.4 m into the base layer. Traces

48 Isaenko 1976, 66–67.

49 Kalechits 1990, 100.

of fireplaces without stone constructions were found at the floor level.

In addition to the common features of all Belarusian buildings of the 4th millennium BC, such as the small size, depth of ca 0.3 to 0.5 m and existence of rounded fireplaces without stone structures, differences were also noted. These are mainly related to the shapes of the pit-houses, i. e. rectangular or oval for the Eastern Polessye culture and circular for the Upper-Dnieper culture. The irregular shapes and small sizes of some buildings suggest that the excavations have only uncovered their sunken, subterranean parts and the buildings themselves may have been larger, as has already been assumed in case of some structures[50]. The post holes found outside the pit-house at the Sasonka site could indicate this, as could the concentration of artefacts around pit-house 2 at Dubovy Loh IV. For example, in some Stone Age dwellings in Estonia and Sweden, it has also been established that the buildings actually occupied larger areas than the sunken parts of the floor would indicate[51].

Almost nothing is known about the internal organisation of the dwelling space. The separate zones of activity within the buildings were not determined by the distribution of the finds, except when the latter were concentrated around fireplaces. Nevertheless, the broken vessels found in dwellings at the Staryja Jurkovičy I, Prorva 2[52] and Nižniaja Alba 1 sites suggest that they were used in enclosed living zone that was quickly abandoned, thereby resulting in large fragments of the pots to be preserved. The exits were identified in five of the pit-houses (Kamaryn 5, Juravičy III, Sasonka, Rudnia I and Stary Dziedzin 4). In four cases they were directed south toward water, and only at Sasonka was the direction north or northwest and parallel to the shoreline. At Sasonka and Rudnia I (possibly also at Stary Dziedzin 4) the entrances were formed by 'corridors' that were 1 to 1.5 m wide.

Discussion and conclusion

The origins of the house-building traditions in Stone Age Belarus are not entirely clear. The existence of dwelling forms from the Pre-Pottery period have already been proposed earlier for the Upper-Dnieper culture[53], as pit-houses similar in shape and size are also known from the Bierascienava, Ludčycy, Novyja Hramyki X and Hlybaŭka III Pre-Pottery Stone Age sites (Appendix 1,6–8 and 10). However, the continuity of the building tradition can still not be confirmed due to the absence of a clear chronology. There are almost no analogies for the oval and rectangular dwellings of the Eastern Polessye culture in the previous stages. Only the Pre-Pottery Stone Age sites in Bierahavaja Slabada and Kryničnaja had rectangular pit-houses measuring 4.3 × 3.8 m and 3.75 × 2.5, respectively[54] (Appendix 1,9 and 11).

Pit-houses are not known to have existed in the contexts of the Upper-Dnieper culture in the neighbouring Smolensk and Bryansk regions in Russia. Similar of post construction buildings with (mostly) roundish or rectangular shapes and fireplaces (only in one case with stone construction) only exist for the earlier Pre-pottery and Pottery periods in the Smolensk region[55]. The nearest settlement sites with pit-houses on the territory of Russia, which, based on the find materials may be dated to the 4th millennium BC, are located in the Valdai Hills and belong to the Valdai culture[56] (late 6th – early 3rd millennium BC; Fig. 1B). However, their radiocarbon chronology is unknown. The remains of the buildings include almost rectangular, slightly deepened pits with a maximum size of 7 × 8 m and fireplaces made of stones. In some cases, two pit-houses are connected by passages, and others have entrances formed by long 'corridors'. The majority of finds were located inside the dwellings. All these features differentiate them from the Belarusian pit-houses, while indicating similarities with the sites located to the east in the Volga and Oka basins[57].

In Ukraine, pit-houses have been found at the sites Hryshivka[58], Mneva-Les (Pustyn'ki 5)[59], and Vita Litovskaya[60] attributed to other cultures of the DDCC. These were mostly rectangular, slightly deepened buildings with a post construction and fireplaces without stones, which coincide with the data of the Eastern Polessye culture of Belarus. At that time, south-eastern Ukraine was a zone of contact between various archaeological cultures. The hunter-gatherers of the DDCC bordered on the population of the Trypillia culture of early farmers. Having replaced the earlier population of the Bug-Dniester culture with rounded pit-houses, they constructed dwellings of a completely different shape and design, which were built of wooden posts and

50 Kalechits 1987, 20.
51 E.g. Larsson 2008, 118; Khrustaleva/Kriiska 2022, 102.
52 Yazepenka 2014, Fig. 94.
53 Kalechits 1990, 100.
54 Ksenzov 1988, 53–64; Kolosov 2017b, 14.
55 Khrustaleva 2016.
56 Zimina 1973; Vereshchagina *et al.* 1995; 1997.
57 E.g. Tsvetkova 1958; Nikitin 1996.
58 Berezanskaya 1975, 150–159; Neprina 1976, 69–72.
59 Mitrofanova 1966, 71–72; Neprina 197, 107.
60 Telegin 1961, 27.

clay[61]. Some were wattle-and-daub structures, while others had log constructions. Although oval-shaped pit-houses that are sunken more than one metre into the ground are known to have existed during earlier periods, most of Trypillian dwellings were above ground. Hearths and/or ovens, and in many cases round or cross-shaped clay altars, were located inside. Trypillia culture definitely influenced their northern neighbours. This impact is visible in the material culture of the DDCC sites located in the area of their contact[62], but not further north. The rectangular shape of the DDCC dwellings in this area were presumably the result of the Trypillian house-building tradition influence, because in the rest DDCC territory only oval or round pit-houses are known to have existed. However, this cannot currently be checked or proven.

To the west of the Neman culture, a few oval and rounded pit-houses of the neighbouring (as well as the similar in many features of the material culture[63]) Narva culture have been discovered. These are located in southern and eastern Lithuania at the Katra 2, Paramėlis 2, Pakretuonė 3 and Žeimenis I settlement sites and can presumably be dated to the 4th millennium BC[64]. The shape and design of these rather small and mostly oval houses, as well as the composition and number of finds are comparable to the houses of DDCC. However, they clearly differ from the few known Narva culture dwellings at the Riigiküla I and Kõnnu settlement sites dated to the 5th millennium BC in northern Estonia and the Estonian islands[65].

The relatively small number of currently known Stone Age dwellings in Belarus, and especially their absence in the central part of the country, is most likely explained by the fact that insufficient research has been conducted in this territory. Nevertheless, further to north, the closest territories that are famous for their Stone Age pit-houses, most of which are dated to the 4th millennium BC, are the northern coast of Estonia, Finland and Russia (Karelia and the Karelian Isthmus)[66].

Thus, according to the available data, two zones of pit-houses distribution can be clearly distinguished in the area between Finland and Ukraine. The first includes southern Belarus and south-eastern Lithuania, while the second includes Finland, the northern coast of Estonia, as well as Karelia and the Karelian Isthmus in Russia (Fig. 8). In the 4th millennium, both these territories were included in the area of distribution for a people associated with Comb Ware culture. This is indicated by the material culture (comb-ornamented pottery is the main marker) as well as the aDNA studies[67]. The house-building traditions, however, appear

Fig. 8: Distribution of sites with two different pit-house traditions: southern – red and northern – pink. After: Pesonen 2002, Fig. 2; Zhulnikov 2003, Tab. 1; Nordqvist *et al.* 2008; Khrustaleva *et al.* 2020.

61 Kordysh 1953.

62 Mitrofanova 1966, 71; 77; Neprina 197, 71; 108–109.

63 Charnyayski/Isaenka 1997, 148.

64 Girininkas 1988; Grinkevičiūtė 2005, Tab. 2; Šatavičius 2016, 32; Marcinkevičiūtė 2016.

65 Khrustaleva *et al.* 2020.

66 Pesonen 2002; Zhulnikov 2003; Mökkönen 2011; Khrustaleva/Kriiska 2021.

67 Cherniavskiy 2012, 88–89; Saag *et al.* 2017, 2189; Mittnik *et al.* 2018, 2; Kriiska *et al.* 2020, 105.

to be local in origin, and developed independently in these different areas.

The pit-houses in these two areas differ both in shape and size, as well as in other features. The remains of small buildings, represented by mostly rounded or oval and rarely rectangular in shape pits, usually with a small number of finds inside, are characteristic of the territory of Belarus. In Finland, north-eastern Russia and along the northern coast of Estonia various architectural forms have been found. However, the pit-houses are often large rectangular pits with vertical walls and flat floors, in which most of the finds are concentrated[68]. Between these two areas – in mainland Estonia, Latvia and most of Lithuania – almost no Stone Age pit-houses have been found, with the exception of a few Pre-Pottery period structures[69]. At the same time, the large-scale excavations at the settlement sites of Sārnate and Zvidze in Latvia[70] and Valma in Estonia[71] have revealed only the remains of above-ground buildings. This suggests that the absence of pit-houses in this middle region is an actual phenomenon and not related to insufficient research. Although in the 4th millennium BC, these territories are related to the Comb Ware culture (see Fig. 1B) that extends to northern Belarus, the pit-house forms do not indicate that the Belarusian architectural tradition was influenced from the north. Most probably, this building tradition continued on this territory throughout the Stone Age and was not associated with any particular archaeological culture.

Acknowledgments: We are grateful to our colleagues Aleh Tkachou and Maxim Charniauski from the Institute of History of the National Academy of Sciences of Belarus and Vitaly Asheychik (independent researcher) for their help in collecting data and consultations, as well as to archaeozoologist Eve Rannamäe from the University of Tartu for identification animal bones. This study was supported by the base-financed project PHVAJ20919 of the Institute of History and Archaeology of the University of Tartu, Mobility grants for doctoral students of graduate schools of the Faculty of Arts and Humanities (University of Tartu), Dora Plus mobility grant (University of Tartu), Vladimir Potanin Foundation (Individual grants for scientific research) and Arheograator Ltd.

68 E.g. Zhulnikov 2003; Mökkönen 2011; Khrustaleva/Kriiska 2021.

69 Grasis 2010; Piličiauskas 2018, 107–109.

70 Vankina 1970; Loze 1988.

71 Yanits 1959.

References

Abuchouski *et al*. 2006: В. Абухоўскі/А. Калечыц/В. Лакіза/М. Чарняўскі. Раскопкі на Аўгустоўскім канале. Гістарычна-археалагічны зборнік, 21, 2006, 178–180.

Artemenko 1957: И. И. Артеменко, Отчет о разведке в бассейне верхнего течения Днепра в 1957 году. Центральный научный архив Национальной академии наук Беларуси. ФАНД, Опись 1, Арх. № 174 (Минск 1957).

– 1958: –, Отчет о работе Белорусского отряда Верхнеднепровской экспедиции АН СССР в 1958 г. Центральный научный архив Национальной академии наук Беларуси. ФАНД, Опись 1, Арх. № 175 (Минск 1958).

– 1962: –, Поселения среднеднепровской культуры на территории Верхнего Поднепровья. Краткие сообщения Института Археологии, 88, 1962, 64–73.

– 1964: –, Неолитическое поселение в урочище Сосонка. Краткие сообщения Института Археологии 101, 1964, 111–115.

Berezanskaya 1975: С. С. Березанская, Неолитическая стоянка у хутора Гришевка на средней Десне. Советская археология 2, 1975, 148–168.

Bronk Ramsey 2021: C. Bronk Ramsey, OxCal 4.4 manual (Oxford 2021). https://c14.arch.ox.ac.uk/oxcal/OxCal.html

Charniauski 2014: Макс. М. Чернявский, К вопросу о разночтении материалов северобелорусской культуры в белорусской и российской историографии. В: Г. Н. Поплевко (Ред.), Материалы и исследования по археологии России и Беларуси: "Культурное взаимодействие древних сообществ конца VII–II тыс. до н.э. верховьев Западной Двины и Днепра (технологические и хозяйственные аспекты)" (Санкт-Петербург 2014) 24–29.

– 2016: –, Новые даты с поселения Асавец 2. In: A. N. Mazurkevich/M. A. Kulkova/E. V. Dolbunova (Eds.), Radiocarbon Neolithic Chronology of Eastern Europe in the VII–III Millennium BC (Smolensk 2016) 310–316.

–/Kryvaltsevich 2011: –/M. Kryvaltsevich, Belarusian wetland settlements in Prehistory. In: E. Prackėnaitė (Ed.), Wetland settlements of the Baltic: A prehistoric perspective (Vilnius 2011) 113–131.

Charnyauski 2011: М. М. Чарняўскі, Каменны век Беларусі. Ілюстраваны канспект лекцый (Мінск 2011).

–/Isaenka 1997: –/У. Ф. Ісаенка, Нёманская культура. У: М. М. Чарняўскі/А. Г. Калечыц (Рэд.), Т. 1. Каменны і бронзавы вякі. (Э. М. Зайкоўскі, У. Ф. Ісаенка, А. Г. Калечыц і інш.). Археалогія Беларусі: У 4 т. (Мінск 1997) 145–170.

Cherniavskij 2014: М. М. Чернявский, Асавец 4 – ранненеолитическое поселение в Северной Беларуси. Проблемы Балтийской археологии 2, 2014, 30–41.

Chernyavskiy 2004: М. М. Чернявский, К проблеме хронологии неолита Беларуси. В: В. И. Тимофеев/Г. И. Зайцева (Ред.), Проблемы хронологии и этнокультурных взаимодействий в неолите Евразии (хронология неолита, особенности культур и неолитизация регионов, взаимодействия неолитических культур в Восточной и Средней Европе) (Санкт-Петербург 2004) 149–154.

– 2012: –, Культуры раннего и среднего неолита белорусского Подвинья. В: Г. Н. Поплевко (Ред.) Материалы и исследования по археологии России и Беларуси: "Комплексное исследование и синхронизация культур эпохи неолита – ранней бронзы Днепровско-Двинского региона" (Санкт-Петербург 2012) 88–99.

Ezepenko 2016: И. Н. Езепенко, Материалы к радиоуглеродной хронологии среднего неолита Поднепровья Беларуси

(поселения Днепра и бассейна Березины). В: А. Н. Мазуркевич/М. А. Кулькова/Е. В. Долбунова (Ред.), Радиоуглеродная хронология эпохи неолита Восточной Европы VII–III тысячелетия до н.э. (Смоленск 2016) 280–289.

–/Voronenko 2017: –/О. В. Вороненко, Неолитические материалы поселения Комарин 5 в бассейне верхнего Днепра (Гомельское Поднепровье) по итогам раскопок 1998, 2005–2007, 2011 годов. Самарский научный вестник, 6, № 3/20, 2017, 155–163.

Gaskevych 2014: D. Gaskevych, Radiocarbon dating of pottery as solution of the problem of chronology of the Bug Dniester Neolithic culture. In: A. N. Mazurkevich/M. E. Polkovnikova/E. V. Dolbunova (Eds.), Archaeology of Lake Settlements IV–II Mill. BC: Chronology of Cultures, Environment and Palaeoclimatic Rhythms (Saint Petersburg 2014) 50–54.

Girininkas 1988: A. Girininkas, Pakretuonės 3-čia gyvenvietė. Archeologiniai Tyrinėjimai Lietuvoje 1986 ir 1987 metais (Vilnius1988) 7–10.

– 2009: –, Lietuvos Archaeologija I. Akmens Amžius. Klaipedos Universiteto Baltijos regiono. (Istorijos ir Archeologijos Institutas 2009).

Grasis 2010: N. Grasis, A Mesolithic dwelling: evidence interpreting from the Uʃavas Celmi site in Latvia. Archaeologia Baltica 13, 2010, 58–68.

Grinkevičiūtė 2005: A. Grinkevičiūtė, Pastatai Lietuvos akmens amžiaus gyvenviečių duomenimis. Lietuvos archeologija 28, 2005, 33–58.

Isaenko 1963: В. Ф. Исаенко, Отчет о полевых работах и исследованиях 1962 года. Центральный научный архив Национальной академии наук Беларуси. ФАНД, Арх. № 158; 158а (Альбом) (Минск 1963).

– 1967: –, Неолитические памятники типа Литвин на нижней Припяти. В: В. Д. Будько/Я. Г. Зверуго/В. Ф. Исаенко/К. П. Шут (Ред.), Белорусские древности: докл. к конф. по археологии Белоруссии, январь-февраль 1968 г. (Минск 1967) 48–106.

– 1976: –, Неолит Припятского Полесья (Минск 1976).

Kalechits 1975: Е. Г. Калечиц, Отчет Сожского отряда о полевых исследованиях в 1975 г. Центральный научный архив Национальной академии наук Беларуси. ФАНД, Арх. № 517 (Минск 1975).

– 1976: –, Отчет о полевых исследованиях в 1976 г. Сожского отряда. Центральный научный архив Национальной академии наук Беларуси. ФАНД, Арх. № 532 (Минск 1975).

– 1977: –, Отчет о полевых исследованиях в 1977 г. отряда по изучению памятников каменного века на территории левобережного Днепра. Центральный научный архив Национальной академии наук Беларуси. ФАНД, Арх. № 568 (Минск 1977).

– 1978: –, Отчет о полевых исследованиях в 1978 г. Центральный научный архив Национальной академии наук Беларуси. ФАНД, Арх. № 589 (Минск 1978).

– 1979: –, Отчет о полевых исследованиях 1979 г. Центральный научный архив Национальной академии наук Беларуси. ФАНД, Арх. № 658 (Минск 1979).

– 1980: –, Отчет о полевых исследованиях 1980 г. Сожского отряда по изучению каменного века. Центральный научный архив Национальной академии наук Беларуси. ФАНД, Арх. № 684 (Минск 1980).

– 1982: –, Отчет о полевых исследованиях Сожского отряда в 1982 г. Центральный научный архив Национальной академии наук Беларуси. ФАНД, Арх. № 786 (Минск 1982).

– 1983: –, Отчет о полевых исследованиях в 1983 г. Центральный научный архив Национальной академии наук Беларуси. ФАНД, Арх. № 869 (Минск 1983).

– 1987: –, Памятники каменного и бронзового веков Восточной Белоруссии (Минск 1987).

– 1990: –, Об изучении жилищ каменного века в Посожье. В: Н. Н. Гурина/В. И. Тимофеев (Ред.), Полевая археология мезолита-неолита. Сборник научных трудов (Ленинград 1990) 93–101.

– 1997: –, Верхнедняпроўская культура. У: М. М. Чарняўскі/А. Г. Калечыц (Рэд.), Т. 1. Каменны і бронзавы вякі. (Э. М. Зайкоўскі, У. Ф. Ісаенка, А. Г. Калечыц і інш.). Археалогія Беларусі: У 4 т. (Мінск 1997) 170–190.

Khrustaleva 2016: I. Yu. Khrustaleva, The earliest dwellings of the Stone Age in Smolensk and Pskov Regions of Russia. Самарский научный вестник 4/17, 2016, 77–85.

Khrustaleva/Kriiska 2021: I. Khrustaleva/A. Kriiska, From a concentration of finds to Stone Age architecture: the Lommi III pit-house in Northwestern Russia. Documenta Praehistorica XLVIII, 2021, 82–101.

–/– 2022: –/–, Jägala Jõesuu V Stone Age settlement site (northern Estonia): Spatial and contextual analysis of finds. Estonian Journal of Archaeology 26, 2, 2022, 81–124.

– *et al*. 2020: –/R. Roog/M. Kholkina/A. Kriiska, Hunter-gatherer pit-houses in Stone Age Estonia. Archaeological and Anthropological Sciences 12/2, UNSP 56, 2020, 1–17.

Kolosov 2009a: А.В. Колосов, Отчет об археологических работах 2008 г. в бассейне р. Сож (Могилевская область). Центральный научный архив Национальной академии наук Беларуси. ФАНД, Арх. № 2603 (Могилев 2009).

– 2009b: –, Археологические древности Могилевского Посожья. По материалам экспедиции 2002–2008 гг. (Могилев 2009).

– 2013: –, Отчет об археологических работах 2012 г. в Могилевском Посожье. Центральный научный архив Национальной академии наук Беларуси. ФАНД, Арх. № 2985 (Могилев 2013).

– 2017a: –, О радиоуглеродной хронологии памятников каменного века Могилевского Посожья. В: А. С. Мельникова (Ред.), Романовские чтения – 12 [Электронный ресурс]: сборник статей Международной научной конференции (Могилев 2017) 136–138.

– 2017b: –, Структуры обитания в каменном веке Могилевского Поднепровья: состояние источников. В: А. М. Бацюкоў, І. А. Пушкін (Рэд.), Гісторыя Магілёва: мінулае і сучаснасць: зборнік навуковых прац удзельнікаў X Міжнароднай навуковай канферэнцыі, 25–26 мая 2017 г. (Магілёў 2017) 13–17.

– 2019: –, Каменный век Могилевского Посожья: открытия, исследования, результаты 2009–2015 гг. (Могилев 2019).

Kopytin 1992: В. Ф. Копытин, Памятники финального палеолита и мезолита Верхнего Поднепровья (Могилев 1992).

Kordysh, N.L. 1953: N. L. Kordysh, Stone Age dwellings in the Ukraine. Archaeology 6/3, 1953, 167–173.

Kriiska *et al*. 2020: A. Kriiska/V. Lang/A. Mäesalu/A. Tvauri/H. Valk, Eesti esiajalugu I. Eesti esiajalugu (Tartu 2020).

Kryvaltsevich 1986: М. М. 25. Крывальцэвіч, Справаздача аспіранта аддзела археалогіі Інстытута гісторыі АН БССР аб палявых даследаваннях 1985 года на тэрыторыі Цэнтральнага Палесся. Центральный научный архив Национальной академии наук Беларуси. ФАНД, Арх. № 924 (Мінск 1986).

– 1987: –, Справаздача аб палявых даследаваннях 1986 году на тэрыторыі цэнтральных раёнаў Прыпяцкага Палесся Беларусі. Центральный научный архив Национальной академии наук Беларуси. ФАНД. Арх. № 985 (Мінск 1987).

– 2009: –, Першабытнае грамадства. Вялікі гістарычны атлас Беларусі. У 4 т. Т. 1 (Мінск 2009) 20–33.
– 2010: –, Старыя Юрковічы 1 – культурна-храналагічныя аспекты “шнуравога” комплексу. Матэрыялы па археалогіі Беларусі, 18: Даследаванні каменнага і бронзавага вякоў (Мінск 2010) 219–242.
Ksenzov 1988: В. П. Ксензов, Палеолит и мезолит Белорусского Поднепровья (Минск 1988).
– 1997: –, Финальный палеолит и мезолит поднепровья Беларуси. Российская археология, 1, 1997, 5–20.
– 2006: –, Мезолит Северной и Центральной Беларуси. Матэрыялы па археалогіі Беларусі 13 (Мінск 2006).
Kurzyk 2014: K. Kurzyk, A brief history of research on the Globular Amphora Culture in the Polish Lowlands. In: G. Osipovicz (Ed.), Kowal 14. Sepulchral and ritual place of people representing the Globular Amphora Culture (Toruń 2014) 9–13
Lakiza *et al*. 2006: В. Лакіза/А. Калечыц/В. Абухоўскі, Археалагічныя раскопкі на помніку позняга неаліту – бронзавага веку Навасёлкі 1. Гістарычна-археалагічны зборнік 21, 2006, 183–184.
Larsson 2008: Å.M. Larsson, Taking out the Trash: On Excavating Settlements in General, and Houses of the Battle Axe Culture in Particular. Current Swedish Archaeology 15–16, 2008, 111–136.
Lipnitskaya 1979: О. Л. Липницкая, Исследования в Могилевской, Гродненской и Брестской областях. Археологические открытия 1978 года (Москва 1979) 441.
Loze 1988: И. А. Лозе, Поселения каменного века Лубанской низины. Мезолит, ранний и средний неолит (Рига 1988).
Marcinkevičiūtė 2016: E. Marcinkevičiūtė, The Neolithic in South-east Lithuania. In: G. Zabiela/Z. Baubonis/E. Marcinkevičiūtė (Eds.), Hundred years of archaeological discoveries in Lithuania (Vilnius 2016) 50–65.
Mitrofanova 1966: В. И. Митрофанова, Поздненеолитическое поселение в урочище Лес близ с. Мнево на Черниговщине. В: В. Ф. Исаенко и др. (Ред.), Древности Белоруссии. Материалы конференции по археологии Белоруссии и смежных территорий (Минск 1966) 68–78.
Mittnik *et al*. 2018: A. Mittnik/C.-C. Wang/S. Pfrengle/M. Daubaras/G. Zarina/F. Hallgren/R. Allmäe/V. Khartanovich/V. Moiseyev/M. Tõrv/A. Furtwängler/A.A. Valtueña/M. Feldman/C. Economou/M. Oinonen/A. Vasks/E. Balanovska/D. Reich/R. Jankauskas/W. Haak/S. Schiffels/J. Krause. The genetic prehistory of the Baltic Sea region. Nature Communications 442/9, 2018, 1–11.
Neprina 1976: В. И. Неприна, Неолит ямочно-гребенчатой керамики на Украине (Киев 1976).
Nikitin 1996: В.В. Никитин, Каменный век Марийского края (Йошкар-Ола 1996).
Nogin 2013: Е. В. Ногін, Неоліт Північно-Східної України: Наукова монографія (Київ 2013).
Nordqvist *et al*. 2008: K. Nordqvist/O. Seitsonen/P. Uino, Appendix 1. Stone Age and Early Metal Period sites in the studied municipalities. In: M. Lavento (Ed.), Karelian Isthmus – Stone Age Studies in 1998–2003. ISKOS 16 (Helsinki 2008) 291–328.
Pesonen 2002: P. Pesonen, Semisubterranean Houses in Finland – a Review. In: H. Ranta (Ed.), Huts and houses. Stone Age and Early Metal buildings in Finland (Helsinki 2002) 9–41.
Piličiauskas 2018: G. Piličiauskas, Virvelinės keramikos kultūra Lietuvoje, 2800–2400 cal BC (Vilnius 2018).
Rassamakin 2012: Yu. Rassamakin, Absolute Chronology of Ukrainian Tripolian Settlements. In: F. Menotti/A. G. Korvin-Piotrovskiy (Eds.), The Tripolye Culture Giant-Settlements in Ukraine Formation, Development and Decline (Oxford, Oakville 2012) 19–69.
Razlutskaya 2013: А. А. Разлуцкая, Неалітычныя матэрыялы паселішча Камарын 5А ў Рагачоўскім Падняпроўі. In: Археологические исследования в Еврорегионе “Днепр” в 2012 году: Научный ежегодник (Гомель 2013) 76–84.
Reimer *et al*. 2020: P. Reimer/W. Austin/E. Bard/A. Bayliss/P. Blackwell/C. Bronk Ramsey/M. Butzin/H. Cheng/R. Edwards/M. Friedrich/P. Grootes/T. Guilderson/I. Hajdas/T. Heaton/A. Hogg/K. Hughen/B. Kromer/S. Manning/R. Muscheler/J. Palmer/C. Pearson/J. van der Plicht/R. Reimer/D. Richards/E. Scott/J. Southon/C. Turney/L. Wacker/F. Adolphi/U. Büntgen/M. Capano/S. Fahrni/A. Fogtmann-Schulz/R. Friedrich/P. Köhler/S. Kudsk/F. Miyake/J. Olsen/F. Reinig/M. Sakamoto/A. Sookdeo/S. Talamo, The IntCal20 Northern Hemisphere radiocarbon age calibration curve (0–55 cal kBP). Radiocarbon 62/4, 2020, 725–757.
Rimantienė, R. 2016: R. Rimantienė, Nida. A bay coast culture settlement on the Curonian lagoon (National Museum of Lithuania 2016).
Saag *et al*. 2017: L. Saag/L. Varul/C. L. Scheib/J. Stenderup/M. E. Allentoft/L. Saag/L. Pagani/M. Reidla/K. Tambets/E. Metspalu/A. Kriiska/E. Willerslev/T. Kivisild/M. Metspalu, Extensive farming in Estonia started through a sex-biased migration from the Steppe. Current Biology 27, 2017, 2185–2193.e6.
Šatavičius 2016: E. Šatavičius, The First Palaeolithic Inhabitants and the Mesolithic in Lithuanian Territory. In: G. Zabiela/Z. Baubonis/E. Marcinkevičiūtė (Eds.), Hundred years of archaeological discoveries in Lithuania (Vilnius 2016) 8–39.
Skoglund *et al*. 2014: P. Skoglund/H. Malmström/A. Omrak/M. Raghavan/C. Valdiosera/T. Günther/P. Hall/K. Tambets/J. Parik/K.-G. Sjögren/J. Apel/E. Willerslev/J. Storå/A. Götherström/M. Jakobsson, Genomic diversity and admixture differs for Stone-Age Scandinavian foragers and farmers. Science 344/6185, 2014, 747–750.
Solberg 1989: B. Solberg, The Neolithic transition in southern Scandinavia: Internal development or migration. Oxford Journal of Archaeology 8, 1989, 261–296.
Telegin 1961: Д. Я. Телегин, К вопросу о днепро-донецкой неолитической культуре. Советская археология, 4, 1961, 26–40.
Tkachov 2017: О. Ю. Ткачев, Ранненеолитическая керамика Западной Беларуси: современное состояние и перспективы изучения. Самарский научный вестник, 6, № 4/21, 2017, 110–116.
Tsvetkova 1958: И. К. Цветкова, Неолитические жилища стоянки Володары. Советская Археология 2, 1958, 112–123.
Vankina 1970: Л. В. Ванкина, Торфяниковая стоянка Сарнате (Рига 1970).
Vereshchagina *et al*. 1995: И. В. Верещагина/Г. В. Синицына/В. И. Тимофеев/О. М. Тихомирова/Л. Г. Шаяхметова/В. Я. Шумкин, Каменный век Верхневосточного региона (по материалам исследований Верхневосточной экспедиции ЛОИА АН СССР – ИИМК РАН, проведенных под руководством Н. Н. Гуриной), 1. Материалы к археологической карте. Археологические изыскания, 27 (Санкт-Петербург 1995).
Vereshchagina *et al*. 1997: И. В. Верещагина/Н. Н. Гурина/Т. Б. Крылова/Г. В. Синицына/В. И. Тимофеев/В. Я. Шумкин, Каменный век Верхневолжского региона, 2. Археологические изыскания, 55 (Санкт-Петербург 1997).
Yanits 1959: Л. Ю. Янитс, Неолитическое поселение Валма. В: Г. Моора (Ред.) Труды Прибалтийской объединенной комплексной экспедиции, I, Вопросы этнической истории народов Прибалтики (Москва 1959) 32–75.

Yazepenka 1995: I. M. Язэпенка, Матэрыялы паселішча ва ўрочышчы Сасонка і яго месца ў неаліце Верхняга Падняпроўя. Гістарычна-археалагічны зборнік 7, 1995, 60–82.
– 2006: –, Паселішча эпохі неаліту і ранняга перыяду бронзавага веку Борак Семінаўскі (вынікі даследаванняў 2000 і 2001 гадоў). Древности Беларуси в системе межкультурных связей. Матэрыялы па археалогіі Беларусі 11, 2006, 20 – 43.
– 2007: –, Трэці сезон даследаванняў на паселішчы Камарын-5 (ваколіцы г. Рагачова) Гомельскай вобласці. Гістарычна-археалагічны зборнік 23, 2007, 195–196.
– 2014: –, Паселішчы неаліту і ранняга перыяду эпохі бронзы міжрэчча Бярэзіны і Дняпра (Магілёў 2014).
–/Yuretski 2013; –/С. С. Юрэцкі, Раскопкі на паселішчы каменнага веку Ніжняя Алба-1 (урочышча Лукошыніца) у нізоўі р. Бярэзіна ў 2011 г. Матэрыялы па археалогіі Беларусі 24, 2013, 323–328.
Zhulnikov 2003: А. М. Жульников, Древние жилища Карелии (Петрозаводск 2003).
Zimina 1973: М. П. Зимина, Некоторые данные о неолитических памятниках в бассейне р. Мсты. В: Н. Н. Гурина (Ред.) Этнокультурные общности лесной и лесостепной зоны Европейской части СССР в эпоху неолита, Материалы и исследования по археологии СССР 172 (Ленинград 1973) 169–172.

Appendix 1: Stone Age buildings in Belarus.

No	Site	Number of buildings	Period	Type of building	Archaeological culture	Building shape	Year of discovery	References
1	Babroviči I	4	Pre-Pottery Stone Age	above-ground	-	?	1963	Isaenko 1976, 28–29.
2	Opal II	1	Pre-Pottery Stone Age	above-ground	–	?	1963	Isaenko 1976, 29–30.
3	Vuscie 2	1	Pre-Pottery Stone Age	above-ground	–	round	2005	Kolosov 2009a, 28–30.
4	Stasieŭka	1	Pre-Pottery Stone Age	above-ground	–	round	1978	Ksenzov 1988, 88–92.
5	Dziednia	1	Pre-Pottery Stone Age	pit-house	–	irregular oval	2006	Kolosov 2009a, 41–44.
6	Bierascienava	3	Pre-Pottery Stone Age	pit-house	–	oval	1987	Ksenzov 2006, 16–17; Fig. 2
7	Novyja Hramyki X (also Aŭramaŭ Buhor)	2	Pre-Pottery Stone Age	pit-house	–	irregular round	1977	Kalechits 1987, 20–26; 1990, 94–96.
8	Hlybaŭka III (also Babulin Buhor)	5	Pre-Pottery Stone Age	pit-house	–	irregular and triangular	1980	Kalechits 1987, 26–34; 1990, 94–96.
9	Bierahavaja Slabada	1	Pre-Pottery Stone Age	pit-house	–	rectangular	1977	Ksenzov 1988, 53–64.
10	Ludčycy	1	Pre-Pottery Stone Age	pit-house	–	irregular round	1972	Kopytin 1992, 38–40.
11	Kryničnaja	1	Pre-Pottery Stone Age	pit-house	–	rectangular	1978	Lipnitskaya 1979.
12	Niamnova 1	1	Pre-Pottery Stone Age	pit-house	–	irregular round	2004	Abuchouski *et al.* 2006, 178–179.
13	Pierasudavičy	2	Pottery Stone Age	pit-house	Neman	oval?	1963	Isaenko 1963, 9–11; 1976,: 66–67.
14	Strumien VI (also Loša I & Loša II)	6	Pottery Stone Age	pit-house	Upper-Dnieper	oval or round	1975	Kalechits 1987, 61–77.

No	Site	Number of buildings	Period	Type of building	Archaeological culture	Building shape	Year of discovery	References
15	Dubovy Loh IV (also Mišurova hryva)	2	Pottery Stone Age	pit-house	Upper-Dnieper	round	1980	Kalechits 1987, 41–44.
16	Rudnia I	1	Pottery Stone Age	pit-house	Upper-Dnieper	irregular	2008	Kolosov 2009a, 58.
17	Stary Dziedzin 4	1	Pottery Stone Age	pit-house	Upper-Dnieper	irregular	2006	Kolosov 2019, 46.
18	Slabodka I	9	Pottery Stone Age	above-ground	Eastern Polessye	oval	1960	Isaenko 1979, 77.
19	Kamaryn 5A	1	Pottery Stone Age	above-ground	Eastern Polessye	rectangular	2011	Razlutskaya 2012.
20	Juravičy III (also Litvin 1)	1	Pottery Stone Age	pit-house	Eastern Polessye	oval	1962	Isaenko 1963; 1967; 1976; 85–86
21	Juravičy IV (also Litvin 2)	1	Pottery Stone Age	pit-house	Eastern Polessye	rectangular	1962	Isaenko 1963; 1967; 1976, 86–87.
22	Kamaryn 5	1	Pottery Stone Age	pit-house	Eastern Polessye	rectangular	2006	Yazepenka 2007; Ezepenko/ Voronenko 2017.
23	Staryja Jurkovičy I	1	Pottery Stone Age	pit-house	Eastern Polessye	irregular triangular	1986	Kryvaltsevich 1986.
24	Nižniaja Alba 1 (also Lukošynica)	1	Pottery Stone Age	pit-house	Eastern Polessye	rectangular	2011	Yazepenka/Yuretski 2013.
25	Sasonka	1	Pottery Stone Age	pit-house	Eastern Polessye	rectangular	1956	Artemenko 1964; Yazepenka 2014, 23
26	Prorva 2	2	Pottery Stone Age	pit-house	Eastern Polessye	oval	1998	Yazepenka 2014, 31.
27	Borok Seminauski (also Lučyn Barok Siamionaŭski)	1	Pottery Stone Age	pit-house	Eastern Polessye	oval	2000	Yazepenka 2006, 20.
28	Navasiolki 1	1	Pottery Stone Age	pit-house	Corded Ware	round	2005	Lakiza *et al*. 2006, 183–184.
29	Asaviec 7	1?	Pottery Stone Age	above-ground	North Belarusian	?	2000	Charniauski/Kryvaltsevich 2011, 108.
30	Kamienka 5	1	Pottery Stone Age	pit-house	?	oval	2009	Kolosov 2017a, 137–138.
31	Vostraŭ III	2	Pottery Stone Age	pit-house	?	oval	1964	Isaenko 1976, 36.