

BEATA BIELIŃSKA-MAJEWSKA

Department of Archaeology, District Museum in Toruń

b.bielinskamajewska@muzeum.torun.pl

ORCID 0009-0001-1253-6959

THE LATE PALAEOLITHIC IN THE NORTHERN PART OF CENTRAL POLAND IN THE LIGHT OF CURRENT DATA

ABSTRACT

The history of research and discovery of the oldest finds dating back to the end of the Older Stone Age in the northern part of central Poland dates back to the second half of the 19th century. Since then, numerous archaeological sources have been collected and documented to

testify to the presence of the oldest communities in this area. The present article aims to draw attention to the Late (Final) Palaeolithic archaeological finds from this part of Poland, taking into account the current state of knowledge and the latest research conducted in the field.

Keywords: Late (Final) Palaeolithic, Toruń Basin, the lower Vistula River basin, Tanged Points Technocomplex, Poland

Introduction

Excavations, surface surveys, and stray finds in the northern part of central Poland have a long history, dating back to the second half of the 19th century. The work of several generations of archaeologists significantly increased the number of archaeological sources testifying to the presence of the Late Palaeolithic communities in the area. Distinct clusters of sites, from which artefacts (mostly flint) were obtained, are recognisable, especially around the cities of Toruń, Bydgoszcz, and Grudziądz. In this context, a special place is occupied by the Toruń Basin, where numerous flint products and tools associated with the Late Palaeolithic communities have been discovered.

The history of research and archaeological sources (until 2014 including archives) from the northern part of central Poland and related to the Late Palaeolithic

(also known as the Final Palaeolithic) has been already published in an extensive work with a catalogue of sites,¹ therefore they will be only outlined here, taking into account the latest discoveries and research in the field.²

In the northern part of central Poland, there are 201 archaeological sites³ which can be associated with both the Late Palaeolithic and the complex in Brzoza. Included in the present study are also stray finds of flint and organic products as well as certain sites which yielded flint products during the Polish Archaeological Record surface surveys (Archeologiczne Zdjęcie Polski; hereafter as AZP) (101 sites and settlement points). However, the flint materials collected during the said AZP surface surveys will not be discussed in this article. A selection of these was included in another publication by the author.⁴ New sources were supplied by excavations⁵ conducted since 2015 by the District Museum in Toruń on Site 50 in Brzoza, located in the Toruń Basin.

¹ See Bielińska-Majewska 2018a for the older literature.

² The data behind the article was earlier presented by the author during an international conference – 26th EAA (European Association of Archaeologists) Annual Meeting in Budapest, Hungary, 26–30 August 2020 – under the title “The Late Palaeolithic in the northern part of central Poland”. In the present contribution, the previous information has been supplemented by the current state of research (up to and including the year 2022).

³ The article does not take into account the sites in Ludowice and Paliwodzizna, where Mesolithic settlements dominate. According to the authors of the research, selected flint materials from these sites can be associated with the Late Paleolithic (Osipowicz *et al.* 2022).

⁴ Bielińska-Majewska 2018a.

⁵ The excavations have been conducted since 2013 under the direction of the author of the publication.

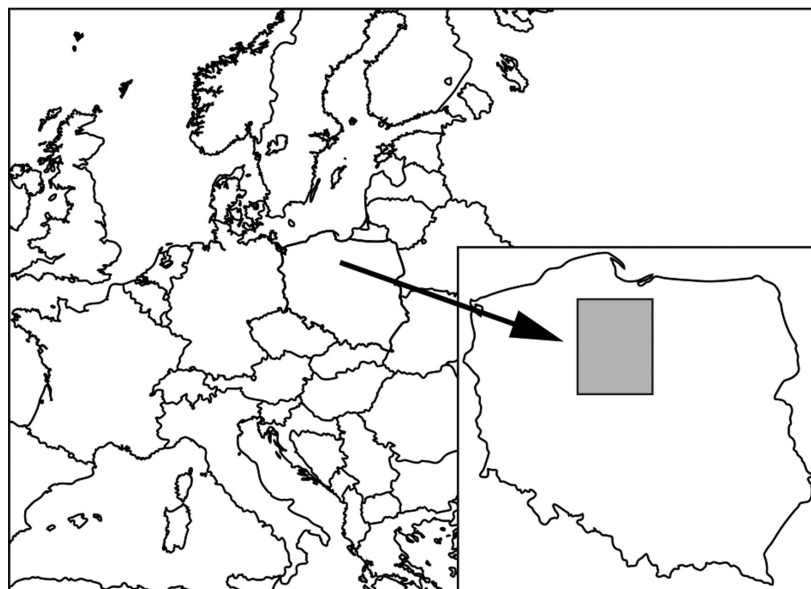


Fig. 1. The northern part of central Poland. The territorial scope of the discussed area (computer processing by M. Majewski).

Location and research history

In this article, the northern part of central Poland will be identified with the area referred to as the South Baltic Lake District according to the division by Jerzy Kondracki,⁶ which includes numerous micro- and macroregions. The territorial range established for the study, within which the Late Palaeolithic finds were discovered, covers the area between the basin of the lower Vistula, reaching the vicinity of Gniew, and the upper Noteć. According to the current administrative division of Poland, it belongs partly to the Kuyavian-Pomeranian and Pomeranian Voivodship (Fig. 1).

Archaeological sources associated with the Late Palaeolithic and discovered in the northern part of central Poland have rarely been mentioned in synthetic works. This is especially true of finds discovered near Toruń. The few studies by Polish authors sometimes include single objects or selected sites from this part of Poland.⁷ Some studies contain outdated information about the location, name, or numbering of specific sites, as well as the place where collections are stored.⁸ Only single sites from the basin of the lower Vistula and the upper Noteć are mentioned in the works of foreign researchers, although the history of their acquisition and research dates back to the second half of the 19th century.⁹

In the second half of the 19th century and at the beginning of the 20th century, the first chance discoveries and expeditions-excursions were made, among others, by people acting on behalf of the existing scholarly societies (Polish and German). Their activities consisted mainly of collecting archaeological finds (including flint) for the needs of museums that were being established at that time. The Interwar Period (between the First and Second World Wars) and after 1945 is the time of surface surveys, leading to the discovery of new archaeological sites documenting the oldest history of the region. At that time, the vicinity of Toruń and Bydgoszcz was visited by specific archaeologists operating in various research centres in Poland. Konrad Jażdżewski or Józef Kostrzewski must be mentioned in this context.¹⁰ At the beginning of the 1960s, the vicinity of Bydgoszcz sparked the interest of Michał Kobusiewicz, who, on behalf of the Archaeological Museum in Poznań and together with Czesław Potemski from the District Museum in Bydgoszcz, conducted excavations in this area. Earlier, in the 1950s, new Palaeolithic sites in this region were discovered by Tadeusz Wiślański.¹¹

The 1970s–90s were a time of extensive surface verification and surface exploration of archaeological sites, carried out mainly as part of the AZP, which was also continued in the early 21st century. The works were

⁶ Kondracki 2009.

⁷ Kostrzewski 1966; Schild 1975; Sulgostowska 1989; 2005; 2009; Kobusiewicz 1999; Sobkowiak-Tabaka 2011.

⁸ Schild 1975; Sulgostowska 1989; Wóźny 1996; Cyrek, Sudol 2009; Osipowicz 2010; 2019; Galiński 2019.

⁹ La Baume 1931; Taute 1968; Winkler 2019.

¹⁰ Bielińska-Majewska 2017; 2018b.

¹¹ Kobusiewicz 1999.

managed by employees of various scientific and scholarly institutions, museums, and the Kuyavian-Pomeranian Voivodship Office for the Protection of Monuments in Toruń operating in the discussed area. Some sites located in the southern part of the Kashubian Lake District, where Palaeolithic artefacts have been discovered (along with Mesolithic ones), were studied by Zbigniew Bagniewski, acting on behalf of the Wrocław University.¹² In the 1970s, several Palaeolithic sites in the vicinity of Bydgoszcz were discovered by Wiktor Stoczkowski.¹³ More information on the oldest archaeological discoveries can also be found in the works of Jacek Woźny.¹⁴

In the 1970s, the area around Toruń was surveyed by Andrzej Prinke from the Archaeological Museum in Poznań and Bogusława Wawrzykowska from the District Museum in Toruń, as well as Marian Marciniak and Wojciech Mroczynski. The researchers conducted surface surveys in a dune area, until the early 1990s known as Toruń-Rudak (later as Brzoza). Earlier, in 1934, on behalf of the Baltic Institute, surface reconnaissance in this area was conducted by Jacek Delekta and in 1965 and 1970 by Bonifacy Zielonka. The entire zone, a dune field about 1200 x 600 metres in size, yielded numerous flint products and is referred to in the literature as a complex of flint concentrations, finds, or sites. Since 2015 (according to the findings of the Kuyavian-Pomeranian Voivodship Office for the Protection of Monuments in Toruń), the area has been renamed to Site 50 in Brzoza. In the 1990s, research in this area was carried out by, among others, Stanisław Kukawka from the current Institute of Archaeology of the Nicolaus Copernicus University in Toruń (IA NCU), B. Wawrzykowska from the District Museum in Toruń and Wojciech Sosnowski from the Kuyavian-Pomeranian Voivodship Office for the Protection of Monuments in Toruń, as well as Krzysztof Cyrek from the IA NCU (in 2001).

Understanding the history of research in the discussed place requires familiarity with the current nomenclature and the issues related to the numbering of individual concentrations. Otherwise, it would be easy to create and reproduce (following the older literature) incorrect and outdated information regarding, for example, the number of sites, as well as the location of the complex in Brzoza.¹⁵ Information on the above subject has been explained in selected publications.¹⁶

In the vicinity of Grudziądz, there are also several sites (including archival ones) where flint products associated with the Late Palaeolithic were discovered, such as Grudziądz-Mniszek or Grudziądz-Rudnik, among others.¹⁷ Another is a multicultural Site III in Grudziądz-Mniszek, where Late Palaeolithic flint products were registered. The site was studied in the 1980s by M. Marciniak from the Museum in Brodnica and Andrzej Bokiniec from the IA NCU.¹⁸

In the northern part of central Poland (between Toruń and Grudziądz), there is also Site 36 in Trzciano, which was excavated by Ryszard Kirkowski in the 1990s. It is a multicultural site, where among the materials dating to the Late Neolithic and Early Bronze Age there were also flint products typologically attributable to the Late Palaeolithic.¹⁹

Further source data was provided by wide-scale rescue excavation related to the construction of the A-1 motorway, which took place in the 1990s and at the beginning of the 21st century. It led to the discovery of several sites (e.g. Stare Marzy 4 and 5/5A, Szynych 12 and 13, Klonówka 47, or Kamionki Duże 15), where flint products associated with Late Palaeolithic settlements were present.²⁰

Flint products with Late Palaeolithic features were also recorded at such multicultural sites as Dzikowo 26 (researched in 2003) and Osiek nad Wisłą 8 (1988, 2010). These sites were examined by archaeologists from the IA NCU. The archaeological work in the aforementioned localities was carried out by S. Kukawka and Jolanta Małecka-Kukawka, in the latter place also by A. Bokiniec in the 1980s.²¹ In 2013, the District Museum in Toruń carried out excavations at the multicultural Site 14 in Skrzypkowo, where Late Palaeolithic flint materials were discovered. Since 2015, the museum has been conducting excavations on one of the largest complexes of settlements dating back to the Late Palaeolithic in the Polish Lowlands (Site 50 in Brzoza), located in the north-eastern part of the Toruń military training ground.²² For many years, scientific research in the northern part of central Poland, and especially in the Toruń Basin, has also been carried out by specialists from various fields of science, including those from the Faculty of Earth Sciences of the Nicolaus Copernicus University in Toruń (FES NCU), whose research results are extremely important for studies on the oldest settlements in this part of Poland.²³

¹² Kobusiewicz 1999; Bagniewski 1987; 1997; 1999.

¹³ Stoczkowski 1982.

¹⁴ Woźny 1993; 1996; 2003; 2006; 2021.

¹⁵ Cyrek, Sudol 2009; Osipowicz 2010; 2019.

¹⁶ Prinke 1980; Marciniak, Mroczynski 1983; Bielińska-Majewska 2012; 2015; 2018a.

¹⁷ Łęga 1927; 1933; Marciniak 1982.

¹⁸ Bokiniec, Marciniak 1987.

¹⁹ Osipowicz, Weckwerth 2016; Bielińska-Majewska 2018a.

²⁰ Cyrek 2002; Cyrek, Sudol 2009; Klimek, Dzięgielewski 2005; Cyrek, Bielińska-Majewska 2014; Bielińska-Majewska 2018a.

²¹ Bielińska-Majewska 2017; 2018a.

²² Bielińska-Majewska 2018a; 2021; 2023.

²³ Niewiarowski, Tomczak 1973; Celmer 1996; Weckwerth 2007; Jankowski 2000; 2012; 2017; 2019.

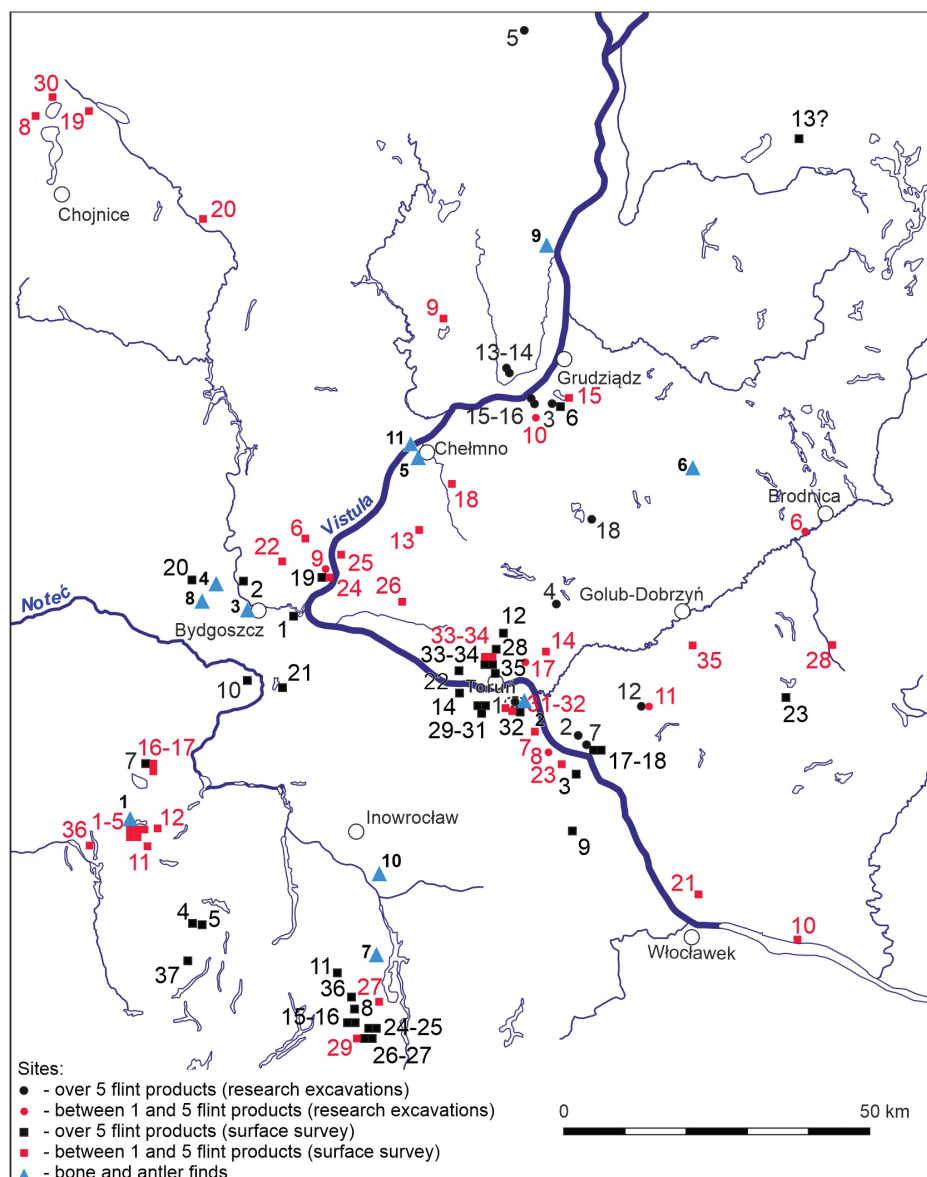


Fig. 2. The northern part of central Poland. Distribution of sites associated with the Late Palaeolithic. The numbers on the map correspond to entries in tables 1, 3–5 (according to Bieleńska-Majewska 2018a with modifications, computer processing by M. Majewski).

Archaeological sources and cultural affiliation

In the northern part of central Poland, over 200 archaeological sites are known, including the complex in Brzoza (Site 50) associated with the Late Palaeolithic (Fig. 2). At these sites, mainly flint products, stone and organic objects, and recently also amber were discovered. These finds were obtained during surface surveys and excavations. Some of them are also chance discoveries.

In the northern part of central Poland, there are 11 known sites where excavations were conducted (yielding more than five Late Palaeolithic flint artefacts each), apart from the Brzoza complex, from which the largest number of flint artefacts were obtained (Tabs. 1–2). The latest dis-

coveries in the Toruń Basin come from the complex of Site 50 in Brzoza (2015–2022). In addition to the above-mentioned complex, excavations were carried out at such sites as Dzikowo 26, Klonówka 47, Grudziądz-Mniszek III, Kamionki Duże 15, Skrzypkowo 14, Stare Marzy 4 and 5/5A, Szynych 12 and 13, Trzciano 36, or Osiek 8 (Tab. 1).

The excavated sites mentioned above are strongly varied in terms of the quantity of the acquired inventories. The richest sites are Stare Marzy 5/5A, from which a total of over 2,000 flint products were collected, and the complex in Brzoza, with over 8,000 flint products obtained until 2001 (not counting the archival collection). The excavations at the Szynych Site 13 provided 1,071 flint products.

Table 1. A list of archaeological sites with flint products discovered during excavations in the northern part of central Poland. The ordinal numbers correspond to sites in Fig. 2 (according to Bielińska-Majewska 2018a, with modification).

No.	Archaeological site	Site (number)	Type of research	Number of finds	Comments
1	Brzoza	Complex	S, R	8792+ (research until 2001); 24000+	(until the 1990s Toruń-Rudak); without archival collections; As of 2015 site 50 (see also table 2) (2015–2022)
2	Dzikowo	26	R	8+	–
3	Grudziądz-Mniszek	III	R	43+	–
4	Kamionki Duże	15	R	29	–
5	Klonówka	47	R	200+	–
6	Mszano	14	R	2	–
7	Osiek nad Wisłą	8	S, R	190+	–
8	Otłoczyn	1	R	4	–
9	Pałcz	5	R	1	–
10	Ruda	3-6	R	1	–
11	Skrzypkowo	13	R	1	–
12	Skrzypkowo	14	S, R	92	–
13	Stare Marzy	4	R	8	–
14	Stare Marzy	5, 5A	R	2341	–
15	Szynych	12	R	107	–
16	Szynych	13	R	1071	–
17	Toruń	327	R	1	–
18	Trzciano	36	R	30+	–
Total				36921+	–

S – surface survey; R – research excavation; + – means more than the given number

The latest excavations carried out at Site 50 in Brzoza²⁴ (2015–2022) revealed over 24,000 flint products (in several concentrations) from the preserved stratigraphic alignment and were documented in a planigraphic system.²⁵ (Tab. 2). In the acquired inventory, over 200 cores and over 470 flint tools were distinguished, as well as numerous chips, flakes, scales, and wastes related to various stages of flint processing. Three types of products dominate among the flint tools: tanged

points, burins, and end scrapers (Figs. 3–6). Stone objects related to the processing of flint and fragments of animal bones were also found. During the latest seasons of excavation in Brzoza, amber was also discovered²⁶ (fragments of amber and two items, probably lumps; Fig. 6: 6). Very important for this site are the results of specialist research conducted so far, such as an analysis of the geographical environment and pedostratigraphy²⁷ of the site, as well as petrographic, archaeozoological,

²⁴ In the case of Brzoza Site 50, excavations and desk research has not yet been completed, therefore the present article discusses only preliminary findings related to the latest discoveries.

²⁵ Bielińska-Majewska 2021; 2022; 2023.

²⁶ Amber obtained from this site will be the subject of a separate publication. It is currently under analysis (author:

Barbara Łydzba-Kopczyńska, PhD, Cultural Heritage Research Laboratory, Faculty of Chemistry, University of Wrocław).

²⁷ The analysis was performed by prof. Michał Jankowski, Faculty of Earth Sciences and Spatial Management of the NCU, who is also a regular consultant for the Brzoza excavations.

Table 2. Brzoza site 50, Toruń district. A summary of excavation surface and the number of flint products obtained within trenches excavated 2015–2022

Excavation season	Excavation surface (m ²)	Number of manual probing drillings	Number of flint materials obtained from the surface	Number of flint materials obtained from the trenches	Number of flint products (according to field inventory)
2015	86	46	252	2615	2867
2016	43	40	82	3140	3230
2017	75	–	29	2829	2858
2018	72	18	114	3063	3185
2019	23	–	57	4118	4180
2020	25	–	38	3001	3075
2021	36	17	35	3402	3439
2022	32	–	114	1938	2052
Total	392	121	721	24106	24886

and traseological analyses,²⁸ which provide data needed for further interpretations related to the activities of the past human groups in these areas.²⁹

In the area in question, there were also six excavated sites with only individual flint products (between 1 and 5) associated with the Late Palaeolithic. These include the Mszano Site 14, Otłoczyn Site 1, Pałcz Site 5, Toruń Site 327, Ruda Sites 3–6, and Skrzypkowo Site 13 (Tab. 1). All of these are chronologically associated predominantly with cultures younger than the Late Palaeolithic.³⁰

In the northern part of central Poland, there are also many sites where the Late Palaeolithic flint products were obtained through a surface survey (Tabs. 3–4). Currently, 37 such archaeological sites are known (over 5 flint products each). Apart from that, there were single archaeological finds (between 1 and 5 artefacts) at 36 sites. The surface-surveyed sites vary significantly in the quantity of obtained materials. The largest number of flint tools was obtained from the following sites: Bydgoszcz-Czersko Polskie, Jeziora Wielkie 3, Kobylarnia 1, Nożyczyn 3, Osiek nad Wisłą 69 and 34, Pałcz 1,³¹ Sierakowo 6, Toruń (sandhills), and Toruń-Kozackie Góry.³² It should also be

noted that the flint tools discovered at these sites were separated from the collected inventory, which also featured elements characteristic of the Mesolithic and the Neolithic.

The basic raw material used for tool making by the communities of that time in the northern part of central Poland was mainly erratic flint of various colours. The Baltic erratic flint, also known as the Cretaceous flint, is one of the frequently found raw materials at Late Palaeolithic sites in this part of Poland. In the discussed area, single products made of the imported chocolate flint were also discovered, which occurred at such sites as Bydgoszcz-Czersko Polskie, Dzikowo 26, Kamionki Duże 15, Nożyczyn 3 and 4, Sierakowo 7, Sierakówko 2, Stare Marzy 4 and 5/5A, Szynych 12, Toruń-Kozackie Góry, Toruń-Wrzosy, or Wycinki 1. Larger quantities of products made of the chocolate flint were recorded at such sites as Brzoza 50, Jeziora Wielkie 3, or Sierakowo 6. At some sites, there were also single items made of the Pomeranian flint, e.g. Brzoza 50 or Stare Marzy 5/5A. Moreover, flakes made of fine-crystalline gneiss³³ were discovered at Kobylarnia Site 1.³⁴ At the site of Brzoza 50, a burin (?) made of gneiss was discovered in 2018.³⁵

²⁸ Currently, further research in this area is being conducted (author: Małgorzata Winiarska-Kabacińska, PhD, Archaeological Museum in Poznań).

²⁹ Bielińska-Majewska 2021; 2022; 2023; Jankowski 2017; Krajcarz 2019; 2020; 2021; 2022; Winiarska-Kabacińska 2022.

³⁰ Stoczkowski 1982; Maciukiewicz-Czarnecka 1972; Kobusiewicz 1999; Marciniak 1998.

³¹ Without flint artefacts obtained during the AZP surface survey.

³² Bielińska-Majewska 2018a.

³³ Petrographic identification was conducted by prof. Maciej Krajcarz, Institute of Geological Sciences Polish Academy of Science, Warsaw.

³⁴ Stoczkowski 1982.

³⁵ Krajcarz 2019.



Fig. 3. Brzoza site 50, Toruń district. Selection of flint tools discovered in 2015–2016:
1–3 – trench 3; 4–5 – trench 3B; 6–12 – trench 3C (collection of the District Museum in Toruń, photo by K. Deczyński, computer processing by M. Majewski).

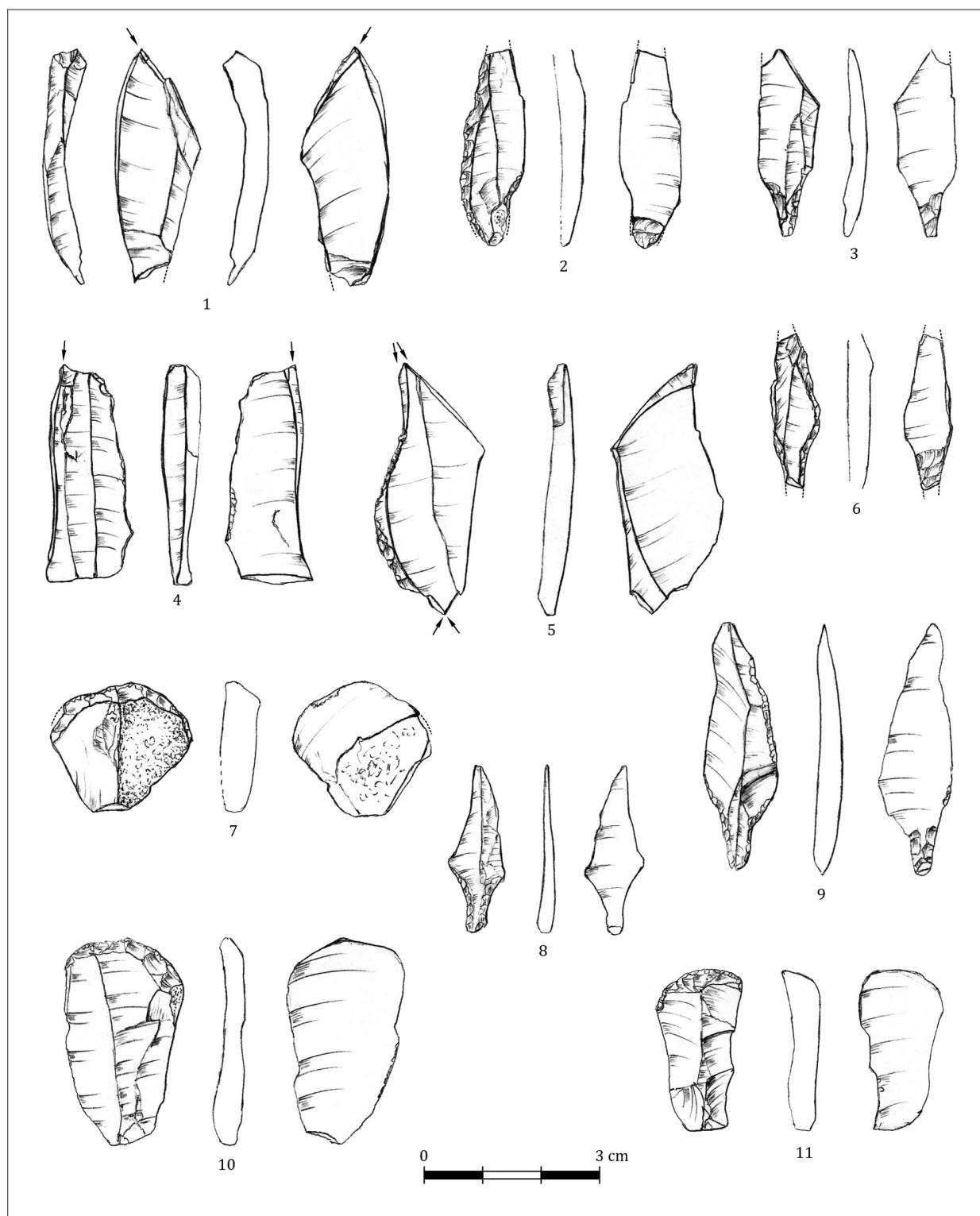


Fig. 4. Brzoza site 50, Toruń district. Selection of flint tools discovered in 2018–2019:
 1–3– trench 14; 4–5 – trench 14A; 6–7 – trench 12; 8–11 – trench 15 (collection of the District Museum in Toruń, drawing by B. Bielińska-Majewska, computer processing by M. Majewski).



Fig. 5. Brzoza site 50, Toruń district. Selection of tools discovered in 2020–2021: 1, 2, 4, 5 – trench 15C; 3 – trench 15B; 6 – trench 15D; 7, 8 – trench 16; 9 – trench 17 (collection of the District Museum in Toruń, photo by K. Deczyński, computer processing by M. Majewski).

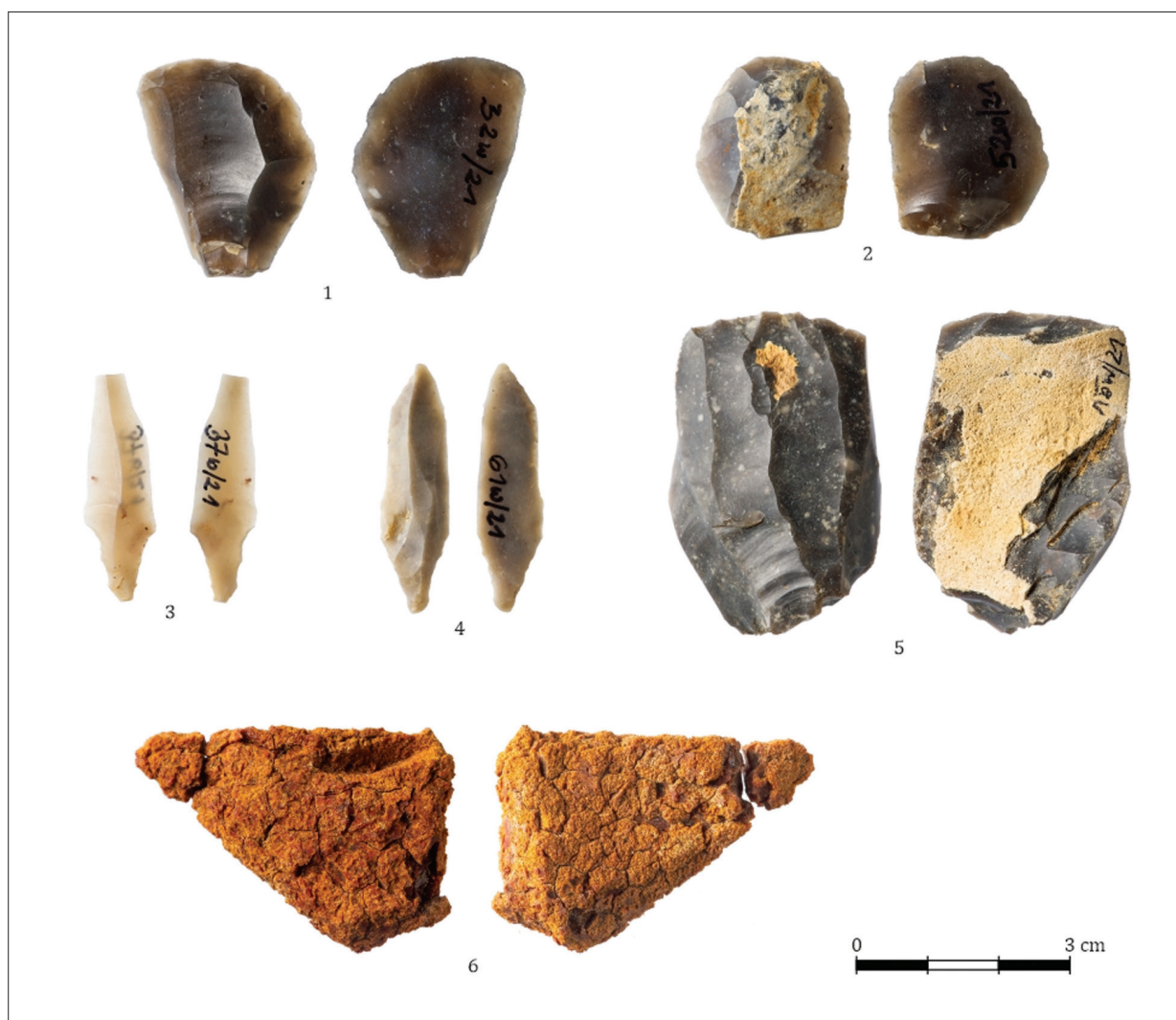


Fig. 6. Brzoza site 50, Toruń district. Selection of flint tools, cores and amber discovered in 2021: 1, 2, 4, 5, 6 – trench 15E; 3 – trench 15C (collection of the District Museum in Toruń, photo by K. Deczyński, computer processing by M. Majewski).

Stone objects include, among others, hammerstones and stone bases or fabricators made of stone other than flint. In the presented area, a small number of such items were obtained along with Palaeolithic flint products. From the northern part of central Poland, several objects made of stone are known. Among them, there are three stone hammerstones (made of quartzite and granitoid³⁶) obtained during the excavations in Brzoza in 2001, a postglacial boulder with a smaller stone discovered in Szynych Site 13,³⁷ and a few presumed hammerstones,

including two discovered at Site 5 in Stare Marzy. There is also a fabricator discovered at the site of Trzciano 36 and probably a polishing stone/fabricator (?) from the Scandinavian slate³⁸ discovered in Stare Marzy 5.³⁹

During the last excavations at the site of Brzoza 50 (2015–2022) more than 20 items made of material other than flint were discovered. Some of them bear signs of damage and traces of anthropogenic origin. Petrographic identification⁴⁰ performed for the stone objects showed that quartzite sandstones and gneisses dominate among

³⁶ Specification of the raw material defined by Halina Pomianowska, PhD, NCU.

³⁷ Cyrek 2002.

³⁸ Specification of the raw material defined by Marek Kachnic, PhD, NCU.

³⁹ Bielińska-Majewska 2018a.

⁴⁰ Petrographic identification was conducted by prof. Maciej Krajcarz, Institute of Geological Sciences Polish Academy of Science, Warsaw.

Table 3. A list of archaeological sites with more than 5 flint products discovered during a surface survey in the northern part of central Poland. The ordinal numbers correspond to sites in Fig. 2 (according to Bielińska-Majewska 2018a).

No.	Archaeological site	Site (number)	Type of research	Number of finds
1	Bydgoszcz-Czersko Polskie	?	S	72
2	Bydgoszcz-Jachcice	10	S	7
3	Ciechocinek	4	S	7
4	Chwałowo	1	S	9
5	Chwałowo	8	S	9+
6	Grudziadz-Mniszek	?	PS	73
7	Januszkowo Kujawskie	12	S	6
8	Jeziora Wielkie	3	S	88+
9	Jezioro	?	PS	15
10	Kobylarnia	1	S	76
11	Kozie Doły	2	S	6
12	Łysomice	?	S	26
13	Location unknown	?	PS	8
14	Nieszawka	1	S	7
15	Nożyszyn	3	S	23+
16	Nożyszyn	4	S	5+
17	Osiek nad Wisłą	69	S	65
18	Osiek nad Wisłą	34	S	157
19	Pałcz	1	S	22+
20	Pawłówek	?	S	13
21	Prądocin	1	S	9
22	Przysiek	?	L	18
23	Ruda	?	S	6
24	Sierakowo	6	S	28+
25	Sierakowo	7	S	10+
26	Sierakówko	1	S	4+
27	Sierakówko	2	S	4+
28	Toruń-Kozackie Góry	?	S	73
29	Toruń-Podgórz	1	S	27
30	Toruń-Podgórz	2	S	1+
31	Toruń-Podgórz	4	S	13
32	Toruń-PołudniowaObwodnica	8	S	7
33	Toruń-Wrzosy	1	S	5+
34	Toruń-Wrzosy	?	S	14
35	Toruń-wzgórza piaskowe	?	S	136
36	Wycinki	1	S	9+
37	Wydartowo	2	S	3+
Total				1061+

S – surface survey, PS – probably surface survey, L – stray find, + – means more than the given number

Table 4. A list of archaeological sites with single flint products (between 1 and 5) discovered during a surface survey in the northern part of central Poland. The ordinal numbers correspond to sites in Fig. 2 (according to Bieleńska-Majewska 2018a).

No.	Archaeological site	Site (number)	Type of research	Number of finds
1	Biskupin	?	S	1
2	Biskupin	2	S	3
3	Biskupin	15	S	2
4	Biskupin	15a	S	2
5	Biskupin	17	S	1
6	Borówno	1	S	3
7	Brzoza (wieś)	?	S	1
8	Chociński Młyn	?	S	1
9	Czersk Świecki	?	S	1
10	Dobrzyń	?	PS	2
11	Gąsawa	2	S	1
12	Godawy	5a	S	1
13	Gołoty	?	S	2
14	Grębocin	?	PS	1
15	Grudziądz-Rudnik	?	S	1
16	Januszkowo Kujawskie	5a	S	1
17	Januszkowo Kujawskie	11	S	1
18	Małe Czyste	?	PS	1
19	Męcikał	3	S	1
20	Nowy Młyn	?	S	1
21	Osiek	?	PS	2
22	Osielsko	1	S	1
23	Otłoczyn	?	S	1
24	Pałcz	II	S	4
25	Rafa	?	S	1
26	Rzęczkowo	?	PS	4
27	Rzeszyn	?	S	1
28	Rypin (okolica)	?	PS	4
29	Sierakówko	?	S	3
30	Swornegacie	?	S	1
31	Toruń-Południowa Obwodnica	3	S	3
32	Toruń-Południowa Obwodnica	9	S	1
33	Toruń-Wrzosy	2	S	1
34	Toruń-Wrzosy	3	S	4
35	Węgiersk	?	PS	4
36	Wiewiórczyn	3	S	1
Total				64

S –surface survey, PS –probably surface survey

the analysed material (Figs. 7–8). One of the discovered objects was made of sedimentary rock – mudstone (Fig. 8: 2); the smoothness of its surface may be anthropogenic.

In addition, in one of the trenches of the 2022 season at Site 50 in Brzoza, a ferruginous concretion was discovered (in two fragments). According to Maciej Krajcarz,⁴¹ this is not typical ochre, but the specimen could potentially be used to obtain a red-brown pigment (Fig. 8: 4).

From the northern part of central Poland, there are a dozen or so bone and antler objects, at least some of which can be interpreted as Late Palaeolithic (Tab. 5; Fig. 9). Most of these items are barbed harpoons, both uni- and biserial. There were also bone blades and a fragment of a hoe. Such finds as bone blades are problematic to order chronologically, as they can be characteristic of both the Palaeolithic and the Mesolithic. In resolving the issue of their chronological affiliation radiocarbon dating would be helpful. The largest number of antler and bone tools in this area is known from a limestone mine in Lisi Ogon, Site 13, which yielded: a uniserial harpoon (Törring type), three Type 13 three-edged blades as well as a reindeer antler Lyngby-type hoe.⁴² From the study area, there are also tools obtained in Biskupin, Site 24, from the vicinity of Bydgoszcz, and Lachmirowice, Site 2:⁴³ Biskupin 24 – a fragment of a uniserial harpoon of type 12A1 according to Stefan Karol Kozłowski;⁴⁴ the vicinity of Bydgoszcz – a bone harpoon with six one-sided barbs (currently only the lower part of the harpoon head with a single row of barbs is preserved), Type 11 according to Clark⁴⁵ or, according to a different typology, type Surbajny Rękawczyn;⁴⁶ Lachmirowice, Site 2 – a biserial harpoon with a separate shaft of Type 12B.⁴⁷

Furthermore, the literature on the subject also mentions a harpoon from the Vistula, found in the vicinity of Chełmno, which supposedly had close analogies to the harpoon from Stellmoor,⁴⁸ and a harpoon made of reindeer antlers from Książki near Jabłonowo.⁴⁹ Further items of organic materials originate from the complex in Brzoza, Bydgoszcz-Osowa Góra (Ossowo), Nowe, and Site 1 in Szarlej.⁵⁰

During the latest excavations (2015–2022), carried out at the site of Brzoza 50, fragments of animal bones



Fig. 7. Brzoza site 50, Toruń district. Selection of items made of sandstone discovered in 2017, 2020: 1 – trench 8; 2 – trench 14 (collection of the District Museum in Toruń, photo by K. Deczyński, computer processing by M. Majewski).

were found.⁵¹ The obtained animal bones (over 800) were significantly fragmented and burned, which precluded precise determination of the animal species (Fig. 9: 7–8). As determined by Magdalena Krajcarz, most of the bone fragments probably came from animals the size of a reindeer/boar and a hare/fox. A bone fragment found in one of the trenches in 2018 was submitted for ¹⁴C radiocarbon dating. The age of the sample was determined to be 10,370±60 years BP (cal. 12,297±189 years BP),⁵² which is chronologically connected with the end of the Younger Dryas and agrees with the uncovered flint inventory.⁵³

⁴¹ Krajcarz 2022.

⁴² Kozłowski 1920; Kostrzewski 1949; Potemski 1963; Kobusiewicz 1999; Olszewski 2010; Sobkowiak-Tabaka 2011; Bielińska-Majewska 2018a; Orłowska, Osipowicz 2019.

⁴³ Kozłowski 1977; Galiński 1986; Kobusiewicz 1999; Sobkowiak-Tabaka 2011.

⁴⁴ Kozłowski 1977; Galiński 1986.

⁴⁵ Clark 1936.

⁴⁶ Clark 1936; Galiński 1986; Olszewski 2006; Sobkowiak-Tabaka 2011.

⁴⁷ Kozłowski 1977.

⁴⁸ Galiński 1992.

⁴⁹ Marciniak 1998.

⁵⁰ Kozłowski 1920; Kostrzewski 1955; Galiński 1986; Kobusiewicz 1999; Bielińska-Majewska, Makowiecki 2011.

⁵¹ The archaeozoological analysis was performed by Magdalena Krajcarz, PhD, IA NCU.

⁵² Poznań Radiocarbon Laboratory (dating was funded from the Polish National Science Centre research project no. 2016/23/B/ST10/01067 “Geneza i historia rozwoju gleb Kujaw”, project manager: Prof. Michał Jankowski, NCU).

⁵³ Bielińska-Majewska, Jankowski 2021.



Fig. 8. Brzoza site 50, Toruń district. Selection of items made of stone discovered in 2015–2018 and – ferruginous concretion discovered in 2022: 1 – gneiss (?), 2 – mudstone, 3 – gneiss, 4 – ferruginous concretion; 1 – from the surface, 2 – trench 3B, 3 – from the surface, 4 – trench 15D (collection of the District Museum in Toruń, photo by K. Deczyński, computer processing by M. Majewska).

Among the discovered materials, M. Krajcarz was able to distinguish four bone fragments, which were defined as reindeer phalanges (*Rangifer tarandus*; Fig. 9: 7).

In light of current data from the northern part of central Poland, the presence of single typological flint products related to the Arch Backed Technocomplex was found only on a few of the sites examined through excavation and surface surveying. These elements occurred, among others, at such sites as Brzoza 50 (complex), Stare Marzy 5/5A, Skrzypkowo 14, Pałcz 1, and Toruń (sandhills). Most flint items typologically referring to the above technocomplex were recorded in Brzoza (complex).

The flint items obtained from the area in question are mainly associated with the Tanged Points

Technocomplex, primarily with the Swiderian Culture, although there are also typological elements characteristic for the Ahrensburg Culture. Single typological Bromme⁵⁴ tanged points appeared at such sites as Brzoza 50 (complex), Bydgoszcz-Czersko Polskie, Chociński Młyn 1 (Chocimki Młyn), Męcikał 3, Pałcz II, or Toruń (sandhills). In addition, Z. Bagniewski lists two more sites (with individual Lyngby artefacts) that fall within the discussed area: Swornegacie and Czersk Świecki.⁵⁵ A flint tool (Desna shouldered point) was also discovered in the area in question, which, according to M. Marciniak,⁵⁶ can be associated with the Desna Culture. This tool was obtained during the study of the Mesolithic Site 14 in Mszano.

⁵⁴ A single Lyngby-type point was also discovered at Grabowiec, Site 6, and Brodnica during the research conducted as part of the AZP (Marciniak 1995, 42, fig. 1).

⁵⁵ Bagniewski 1997, 82, fig. 35; 1999, 137.

⁵⁶ Marciniak 1998.

Table 5. The northern part of central Poland. List of sites where tools of bone and antler were discovered. The ordinal numbers correspond to sites in Fig. 2 (according to Bielińska-Majewska 2018a).

No	Locality	Find type								Total	Chronology
		Hoe mounting + interchan geable blade	Hoe	Three-edged blade	Awl	Mullerup type harpoon	Gniewino type harpoon – with one barb	Uniserial barbed harpoon	Biserial barbed harpoon	Other	
1	Biskupin	–	–	–	–	–	–	1 P	–	–	Late Palaeolithic
2	Brzoza (Toruń-Rudak)	–	–	–	2 P?	–	–	–	–	–	Late Palaeolithic ?
3	Bydgoszcz (the vicinity)	–	–	–	–	–	–	1 P	–	–	Late Palaeolithic
4	Bydgoszcz-Osowa Góra (Osowo)	–	–	–	–	1 P/M	–	–	–	–	Late Palaeolithic / Mesolithic
5	Chełmno (the vicinity)	–	–	–	–	–	–	–	–	1 P	Late Palaeolithic / Mesolithic
6	Książki	–	–	–	–	–	–	–	–	1?	Late Palaeolithic ?
7	Lachmirowice	–	–	–	–	–	–	–	1 P	–	Late Palaeolithic
8	Lisi Ogon	2 P?/M	1 P	3 P/M	1? P/M	–	–	1 P	–	–	Late Palaeolithic / Mesolithic
9	Nowe	–	–	–	–	–	1 P/M	–	–	–	Late Palaeolithic / Mesolithic
10	Szarlej	–	–	–	–	–	–	–	–	1 P/M	Late Palaeolithic / Mesolithic ?
11	From Visula – the vicinity of Chełmno	–	–	–	–	–	–	–	–	1 P/M?	Late Palaeolithic / Mesolithic ?
Total		2	1	3	3	1	1	3	1	4	19

P – Late Palaeolithic, M – Mesolithic

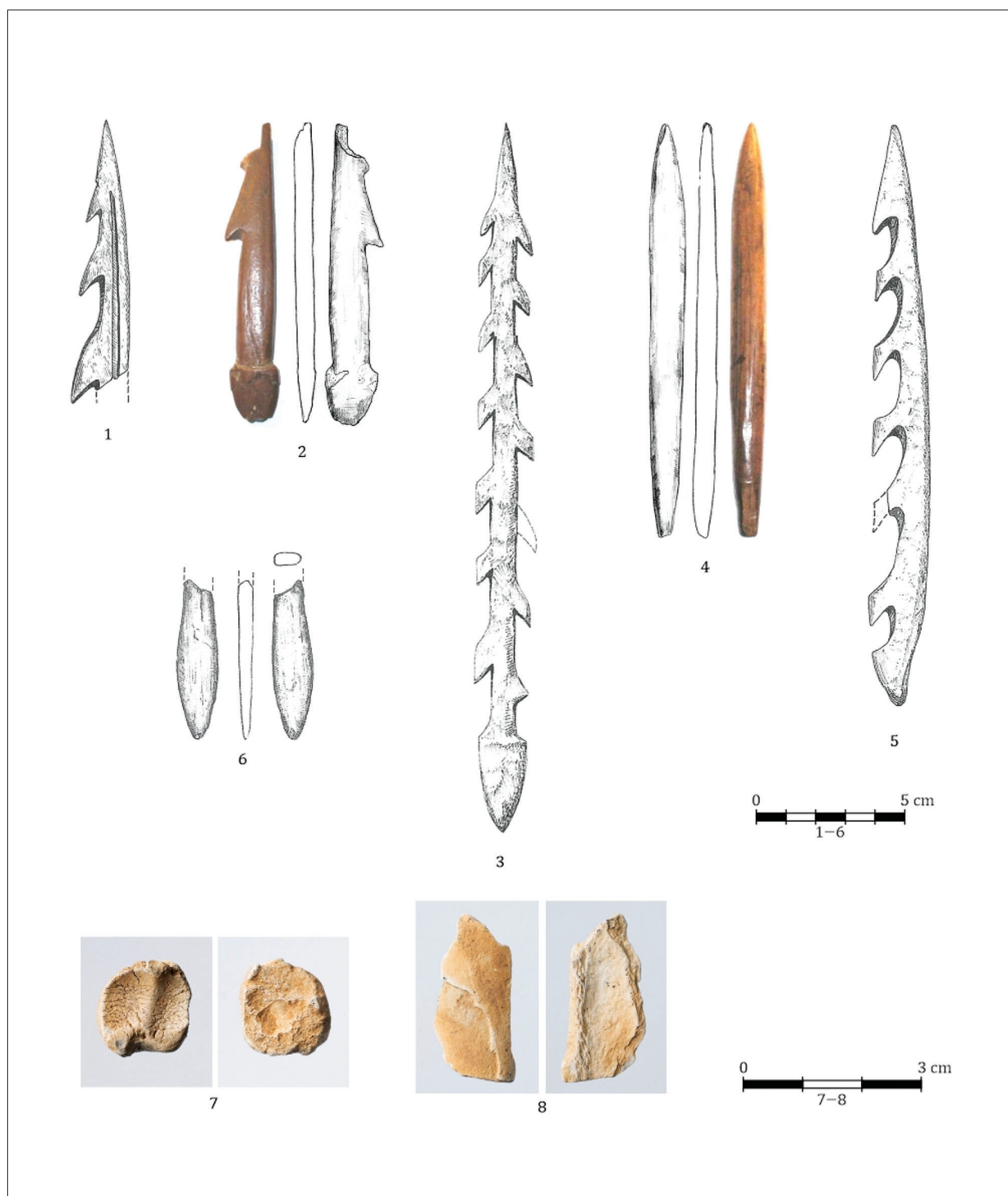


Fig. 9. The northern part of central Poland. Selection of tools from organic raw materials (bone, antlers) and an example of the state of preservation of animal bones in Brzoza site 50. Sites: 1 – Biskupin 24; 2 – Bydgoszcz (the vicinity); 3 – Lachmirowice 2; 4 – Lisi Ogon 13; 5 – Lisi Ogon 13; 6 – Szarlej 1; 7 (the proximal epiphysis of reindeer's second phalanx), 8 (unspecified long bone shaft fragment) – Brzoza 50, excavation season 2016 (1 – according to Kobusiewicz 1999, 88, Fig. XXII; 2, 4 – a collection of the District Museum in Bydgoszcz, photo by B. Bielińska-Majewska; 3 – according to Kobusiewicz 1999, 89, fig. XXIII; 5 – according to Kobusiewicz 1999, 88, fig. XXII; 6 – a collection of the District Museum in Toruń, according to Bielińska-Majewska, Makowiecki 2011, 104, Fig. 7; 7, 8 – a collection of the District Museum in Toruń, photo by K. Deczyński; computer processing by M. Majewski).

The largest number of typological elements corresponding to the Ahrensburg inventory was found in Brzoza.⁵⁷ Furthermore, single-tanged points were also found, among others, at the sites of Januszkowo Kujawskie 12, Klonówka 47, Prądocin 1, Stare Marzy 5/5A, or Wiewiórczyn 3.

Based on the available source data, it can be said that settlements associated with the Tanged Points Technocomplex dominate in the northern part of central Poland and are linked mainly with the Swiderian groups. It should be noted, however, that in the Toruń Basin, at Site 50 in Brzoza, a significant number of points was discovered (compared to other sites in this part of the country), some of which represent tools of the Ahrensburg type, as well as single ones of the Bromme type.⁵⁸ The issue of the presence of morphologically differentiated points on selected sites and their cultural and chronological affiliation requires further verification, analysis, and discussion, especially concerning sites that were excavated and where the artefacts were discovered in a specific stratigraphic context.

Final remarks

Flint finds from the northern part of central Poland assigned to the Late Palaeolithic are mostly in the chronological range from Allerød to the end of the Younger Dryas and the beginning of the Pre-Boreal. The acquired cultural inventories are associated with communities that represent the Late Palaeolithic Arch Backed Technocomplex and the prevalent Tanged Points Technocomplex.⁵⁹

Based on the collected archaeological sources, it can be concluded that the area in question was influenced from different directions, which is visible in the discovered flint inventories. Explicit clusters of Palaeolithic habitation traces can be distinguished around Toruń, Grudziądz, and Bydgoszcz, where the highest number of Late Palaeolithic sites was recorded.

Based on the analyses, it was established that in the northern part of central Poland, there are sites with the remains of domestic activity areas and home-based workshops. Most of the sites are located in sandy areas, the only exceptions being Skrzypkowo 14 in the vicinity of Toruń and Trzciano 36 near Grudziądz. Site 5/5A in Stare Marzy, located in the basin of the lower Vistula, was also an important place for the hunters of that time. The arrangement of preserved flint concentrations (assuming that they are contemporary to each other) with the analogy to Troniny, Site 5, on the upper Warta,⁶⁰ suggests a deliberate layout of the camp with a free space in the centre.⁶¹

When considering the oldest settlements in the northern part of central Poland, a special place is held by the Toruń Basin, where numerous flint items and tools associated with the communities of the Late Palaeolithic have been discovered, the latest finds, uncovered in a well-defined context in Brzoza, Site 50, are the starting point for further taxonomic and chronological determinations concerning climatic changes in this area. The relations between individual cultures within the Tanged Points Technocomplex and the issues related to the presence of flint goods associated with the Arch-Backed Technocomplex (based on technological and typological features) and their connections with other Late Palaeolithic cultures in this region are other issues to be solved. In light of current knowledge, the northern part of central Poland, and especially the Toruń Basin, seems promising for further research on the Late Palaeolithic.

Acknowledgements

The author would like to thank Maciej Majewski, PhD, for the English translation and computer processing of figures, and Krzysztof Deczyński, M.A., for taking photographs of the artefacts.

Bibliography:

- Bagniewski Z. 1987, Mezolityczne społeczności myśliwsko-rybackie południowej części Pojezierza Kaszubskiego, *Acta Universitatis Wratislaviensis, Studia Archeologiczne* XVII.
- Bagniewski Z. 1997, O schyłkowopaleolitycznych kulturach kompleksu z liściakami na Pomorzu, *Acta Universitatis Wratislaviensis, Studia Archeologiczne* XXIX, 25–92.
- Bagniewski Z. 1999, Tanged-points and the Problem of Palaeolithic Settlement in Pomerania, (in:) S.K. Kozłowski, J. Gruba, L. L. Zaliznyakeds (eds), *Tanged Points Cultures in Europe, Lubelskie Materiały Archeologiczne*, XIII, Lublin, 131–144.

⁵⁷ Marciniak, Mroczński 1983; Bielińska-Majewska 2018a; 2022.

⁵⁸ Bielińska-Majewska 2022.

⁵⁹ Schild 1975; Kozłowski, Kozłowski 1975; Kozłowski 1999; 2006.

⁶⁰ Cyrek 1996.

⁶¹ Cyrek, Sudół 2009.

- Bielińska-Majewska B. 2012, Research Report: Some Comments on Late Palaeolithic Lithic Raw Material Economy in the Toruń Basin – Based on Selected Sites, *Anthropologie* 50 (4), 465–488.
- Bielińska-Majewska B. 2015, Z historii badań schyłkowopaleolitycznego kompleksu krzemienic w Brzozie (Toruń-Rudak), *Acta Universitatis Nicolai Copernici, Archeologia* 34, 149–162.
- Bielińska-Majewska B. 2017, Z historii badań nad schyłkowym paleolitem Torunia i jego okolic, *Pomorania Antiqua* 26, 181–196.
- Bielińska-Majewska B. 2018a, *Późny paleolit w dorzeczu dolnej Wisły i górnej Noteci*, Toruń.
- Bielińska-Majewska B. 2018b, Traces of Presence of the Late Palaeolithic Hunters in Toruń and Its Surroundings, (in:) P. Valde-Nowak, M. Nowak, K. Sobczyk, J. Żrałka (eds), *Multas per gentes et multa per saecula: amici magistro et collegae suo Ioanni Christopho Kozłowski dedicant*, Kraków, 205–212.
- Bielińska-Majewska B. 2021, Badania archeologiczne Muzeum Okręgowego w Toruniu w Brzozie stan. 50, gm. Wielka Nieszawka w latach 2018 i 2019, (in:) J. Woźny, J. Szałkowska-Łoś, J. Łoś (eds), XXII Sesja Pomorzoznawczą. *Od epoki kamienia do nowożytności*, Bydgoszcz, 145–158.
- Bielińska-Majewska B. 2022, Diversity of the Late Palaeolithic Tanged Points in the Northern Part of Central Poland in the Light of the Discoveries on Site 50 in Brzoza, Near Toruń, Poland, *Anthropologie* 60 (1), 5–28.
- Bielińska-Majewska B. 2023, The Oldest Traces of Human Presence in the North-eastern Part of the Toruń Military Training Ground, (in:) M. Sudoł-Procyk, M. Krajcarz, Ł. Czyżewski (eds), *Between Archaeological and Environmental Sciences. The Jubilee Celebration of the 50th Anniversary of Scientific Work of Professor Krzysztof Cyrek / Między archeologią a naukami o środowisku. Jubileusz 50-lecia pracy naukowej Profesora Krzysztofa Cyrka*, Toruń, 175–193.
- Bielińska-Majewska B., Jankowski M. 2021, *Na krańcach toruńskiego poligonu. Badania archeologiczne Muzeum Okręgowego w Toruniu w latach 2015–2021*, an exhibition folder, Toruń.
- Bielińska-Majewska B., Makowiecki D. 2011, Narzędzia rogowe i kościane w zbiorach Muzeum Okręgowego w Toruniu, *Rocznik Muzeum Okręgowego w Toruniu* XVIII (2009), 91–108.
- Bokinić A., Marciniak M. 1987, Wstępne wyniki badań na wielokulturowym stanowisku Grudziądz-Mniszek 3, woj. toruńskie, (in:) T. Wiślański (ed.), *Neolit i początki epoki brązu na ziemi chełmińskiej*, Toruń, 223–248.
- Celmer T., 1996, Środowisko przyrodnicze w rejonie stanowisk schyłkowopaleolitycznych „Brzoza” koło Torunia, manuscript deposited in the archive of the Department of Archaeology, District Museum in Toruń.
- Clark J.G.D. 1936, *The Mesolithic Settlement of Northern Europe*, Cambridge.
- Cyrek K. 1996, *Osadnictwo schyłkowopaleolityczne w Zakolu Zaleciańskiego doliny Warty*, Łódź.
- Cyrek K. 2002, Paleolit schyłkowy i mezolit w dolinie Wisły pomiędzy Toruniem a Grudziądzem, (in:) B. Wawrzykowska (ed.), *Archeologia toruńska. Historia i teraźniejszość*, Toruń, 81–90.
- Cyrek K., Sudoł M. 2009, Z najnowszych badań nad paleolitem schyłkowym na Pomorzu Wschodnim, (in:) M. Fudziński, H. Paner (eds.), *Aktualne problemy epoki kamienia na Pomorzu*, Gdańsk, 67–84.
- Cyrek K., Bielińska-Majewska B. 2014, Ostatni łowcy reniferów nad dolną Wisłą. *Wielkopolskie Sprawozdania Archeologiczne* 15, 11–23.
- Galiński T. 1986, Późnoplejstoceny i wczesnolodocienne harpuny i ostrza kościane i rogowe na południowych wybrzeżach Bałtyku między ujściem Niemna i Odry, *Materiały Zachodniopomorskie* 32, 7–69.
- Galiński T. 1992, *Mezolit Pomorza*, Szczecin.
- Galiński T. 2019, *Paleolit i mezolit na Pomorzu*, Szczecin.
- Jankowski M. 2000, Chronologiczna i przestrzenna zmienność gleb na stanowisku archeologicznym Katarzynka (nr 242) w północnej części Kotliny Toruńskiej, *Acta Universitatis Nicolai Copernici, Nauki Matematyczno-Przyrodnicze. Geografia* 30 (104), 97–114.
- Jankowski M. 2012, Lateglacial Soil Paleocatena in Inland-dune Area of the Toruń Basin, Northern Poland, *Quaternary International* 265, 116–125.
- Jankowski M. 2017, *Analiza środowiska geograficznego i pedostratygrafii stanowiska archeologicznego w Brzozie, gm. Wielka Nieszawka (stanowisko nr 50)*. Manuscript deposited in the archive of the Department of Archaeology, District Museum in Toruń.
- Jankowski M. 2019, Ogólna charakterystyka abiotycznych elementów środowiska przyrodniczego, (in:) P. Sewerniak, J. Holc (eds) *Przyroda poligonu toruńskiego. Stan badań i problemy ochrony*, Toruń, 9–26.

- Klimek A., Dziegielewska K. 2005, Schyłkowopaleolityczna pracownia przydomowa na stanowisku 47 w Klonówce, pow. Starogard Gdański. *Pomorania Antiqua* 20, 143–182.
- Kobusiewicz M. 1999, *Ludy zbieracko-łowieckie w północno-zachodniej Polsce*, Poznań.
- Kondracki J. 2009, *Geografia regionalna Polski*, Warszawa.
- Kostrzewski J. 1949, *Pradzieje Polski*, Poznań.
- Kostrzewski J. 1955, *Wielkopolska w pradziejach*, Warszawa-Wrocław.
- Kostrzewski J. 1966, *Pradzieje Pomorza*, Wrocław, Warszawa, Kraków.
- Kozłowski L. 1920, Wielkopolska w epoce kamiennej, part I, *Przegląd Archeologiczny* I (3–4), (1919), 84–98.
- Kozłowski S. K. 1977, Jednorzędowe harpuny typu hawelańskiego w basenie Morza Bałtyckiego, *Archeologia Polski*, XXII, 72–95.
- Kozłowski S. K. 1999, The Tanged Points Complex, (in:) S. K. Kozłowski, J. Gruba, L. L. Zaliznyak (eds) *Tanged Points Cultures in Europe*, Lubelskie Materiały Archeologiczne 13, Lublin, 28–35.
- Kozłowski S. K. 2006, Mapping the Central/East European Terminal Palaeolithic / Earliest Mesolithic, *Archaeologia Baltica* 7, 29–35.
- Kozłowski J. K., Kozłowski S. K., 1975, *Pradzieje Europy od XL do IV tysiąclecia p.n.e.*, Warszawa.
- Krajcarz M. 2019, *Identyfikacja petrograficzna zabytków kamiennych ze stanowiska Brzoza 50 (pow. toruński, gm. Wielka Nieszawka)*, manuscript deposited in the archive of the Department of Archaeology, District Museum in Toruń.
- Krajcarz M. 2020, *Identyfikacja petrograficzna zabytków kamiennych ze stanowiska Brzoza 50 (pow. toruński, gm. Wielka Nieszawka)*, manuscript deposited in the archive of the Department of Archaeology, District Museum in Toruń.
- Krajcarz M. 2021, *Identyfikacja petrograficzna zabytków kamiennych ze stanowiska Brzoza 50 (pow. toruński, gm. Wielka Nieszawka)*, manuscript deposited in the archive of the Department of Archaeology, District Museum in Toruń.
- Krajcarz M. 2022, *Identyfikacja petrograficzna zabytków kamiennych ze stanowiska Brzoza 50 (pow. toruński, gm. Wielka Nieszawka)*, manuscript deposited in the archive of the Department of Archaeology, District Museum in Toruń.
- La Baume W., 1931, Zur Kenntniss der mittleren Steinzeit in Pommerellen, *Blätter für deutsche Vorgeschichte* 8, 1–3.
- Łęga W. 1927, Wyroby krzemienne z Muzeum Miejskiego w Grudziądzu, *Przegląd Archeologiczny* III (2) (1926), 155–159.
- Łęga W. 1933, *Toruń i okolice w czasach przedhistorycznych*, Toruń.
- Maciukiewicz-Czarnecka B. 1972, Materiały z osady kultury pucharów lejkowatych na stan. 5 w Pałczu, pow. Bydgoszcz, *Fontes Archaeologici Posnanienses* XXI (1970), 23–49.
- Marciniak M. 1982, *Kultury archeologiczne paleolitu schyłkowego i mezolitu w dolinie dolnej Wisły (od Torunia do Grudziądza)*, a master's thesis manuscript deposited in the archive of the Department of Archaeology, District Museum in Toruń.
- Marciniak M. 1995, Paleolit i mezolit w międzyrzeczu Wisły, Drwęcy i Osy, (in:) W. Filipiak (ed.) *Najnowsze kierunki najdawniejszych dziejów Pomorza*, Szczecin, 49–63.
- Marcinika M. 1998, Pradzieje regionu brodnickiego, (in:) J. Dygdała (ed), *Brodnica siedem wieków miasta*, Brodnica, 35–66.
- Marciniak M., Mroczynski W. 1983, Nowe materiały schyłkowopaleolityczne z kompleksu stanowisk kultury świderskiej w Toruniu-Rudaku, *Acta Universitatis Nicolai Copernici, Archeologia* 7, 3–39.
- Niewiarowski W., Tomczak A. 1973, Morfologia i rozwój rzeźby obszaru miasta Torunia i jego okolic. *Acta Universitatis Nicolai Copernici, Geografia* 10, 41–91.
- Prinke A. 1980, Schyłkowopaleolityczne stanowiska kultury świderskiej w Toruniu-Rudaku, *Rocznik Muzeum w Toruniu* 7, 127–163.
- Olszewski P. 2006, Fragment grotu harpuna kościanego z okolic Bydgoszczy na tle znaleziska grotów harpunów jednorzędowych z Niżu Polskiego, *Pomorania Antiqua* XXI, 169–186.
- Olszewski P. 2010, Zabytki kościane i rogowe z kopalni wapna pojeziernego w Lisim Ogonie, stanowisko 13, gmina Białe Błota, powiat Bydgoski oraz ich wymowa chronologiczno-kulturowa, *Pomorania Antiqua* XXIII, 97–124.
- Orłowska J., Osipowicz G. 2019, Bone Working Practices in Final Palaeolithic Poland: An Example of a Three-edged Bone point from Lisi Ogon, site 13, (in:) B. V. Eriksen, E. Rensink, S. Harris (eds), *The Final Palaeolithic of Northern Eurasia. Proceedings of the Amersfoort, Schleswig and Burgos UISPP Commission Meetings*, Schriften des Museums für Archäologie Schloss Gottorf – Ergänzungsreihe Band 13, 299–307, Kiel, Ludwig.

- Osipowicz G. 2010, *Narzędzia krzemienne w epoce kamienia na ziemi chełmińskiej*, Toruń.
- Osipowicz G. 2019, Final Palaeolithic and Mesolithic Flint Collections from the Chełmno-Dobrzyń Lakeland, Central Poland. Functional Structure and Preferences in Tool Production, (in:) B.V. Eriksen, E. Rensink, S. Harris (eds), *The Final Palaeolithic of Northern Eurasia. Proceedings of the Amersfoort, Schleswig and Burgos UISPP Commission Meetings*, Schriften des Museums für Archäologie Schloss Gottorf – Ergänzungsreihe Band 13, 309–328, Kiel, Ludwig.
- Osipowicz G., Orlowska J., Kuriga J. 2022, Pedantry in the Palaeolithic? The Story of Two Small Swiderian Pits from Chełmno-Dobrzyń Lakeland, *Sprawozdania Archeologiczne* 74 (1), 325–344.
- Osipowicz G., Weckwerth P. 2016, Schyłkowopaleolityczne i mezolityczne materiały krzemienne ze stanowiska Trzciano 36, gm. Wąbrzeźno, *Fontes Archaeologici Posnanienses* 52, 121–149.
- Potemski C. 1963, Pradzieje Bydgoszczy i powiatu bydgoskiego, *Bydgoskie Towarzystwo Naukowe, Prace Wydziału Nauk Humanistycznych* 1.
- Schild R. 1975, Późny paleolit, (in:) W. Chmielewski, W. Hensel (eds) *Prahistoria ziem polskich*, vol. I, *Paleolit i mezolit*, Wrocław, Warszawa, Kraków, Gdańsk, 159–338.
- Sobkowiak-Tabaka I. 2011, *Spoločności późnego paleolitu w dorzeczu Odry*, Poznań.
- Stoczkowski W. 1982, Schyłkowopaleolityczne i mezolityczne materiały krzemienne z okolic Bydgoszczy, *Komunikaty Archeologiczne. Badania wykopaliskowe na terenie województwa bydgoskiego w latach 1973–1979*, 127–163.
- Sulgostowska Z. 1989, *Prahistoria międzyrzecza Wisły, Niemna i Dniestru u schyłku plejstocenu*, Warszawa.
- Sulgostowska Z. 2005, *Kontakty społeczności późnopaleolitycznych i mezolitycznych między Odrą, Dźwiną i górnym Dniestrem. Studium dystrybucji wytworów ze skał krzemionkowych*, Warszawa.
- Sulgostowska Z. 2009, Związki Pomorza nadwiślańskiego z obszarami sąsiednimi w paleolicie i w mezolicie, (in:) M. Fudziński, H. Paner (eds) *Aktualne problemy epoki kamienia na Pomorzu*, Gdańsk, 47–62.
- Taute W. 1968, *Die Stielspitzen-Gruppen im nördlichen Mitteleuropa. Ein Beitrag zur Kenntnis der späten Altsteinzeit*, Köln.
- Weckwerth P. 2007, Późnovistuliański rozwój sieci rzecznej w rejonie Kotliny Toruńskiej na tle struktur starszego podłoża, *Słupskie Prace Geograficzne* 4, 143–156.
- Winiarska-Kabacińska M. 2022, *Analiza traseologiczną wybranych materiałów krzemiennych ze stanowiska Brzoza nr 50 (AZP 40-44/250), gmina Wielka Nieszawka, powiat toruński, woj. kujawsko-pomorskie*, part 1, manuscript deposited in the archive of the Department of Archaeology, District Museum in Toruń.
- Winkler K. 2019, Ahrensburgien und Swiderian im mittleren Oderraum. Technologische und typologische Untersuchungen an Silexartefakten der Jüngerer Dryaszeit, *Untersuchungen und Materialien zur Steinzeit in Schleswig-Holstein und im Ostseeraum*, Band 11, Kiel, Hamburg.
- Woźny J. 1993, Najstarsze osadnictwo ludzkie z terenu Bydgoszczy, *Kronika Bydgoska* XIII (1991), 201–204.
- Woźny J. 1996, Schyłkowopaleolityczne materiały ze stan. 329 w Toruniu jako przyczynek do różnicowania liściaków dwukątowych kultury świderskiej, *Sprawozdania Archeologiczne* 48, 50–57.
- Woźny J. 2003, *Archeologiczne skarby pradziejów Bydgoszczy od paleolitu do początków średniowiecza*, Toruń.
- Woźny J. 2006, Obozowiska kultur późnopaleolitycznych ze schyłku epoki lodowcowej w Bydgoszczy-Jachcicach, *Materiały do dziejów i kultury sztuki Bydgoszczy i regionu* 11, 11–18.
- Woźny J. 2021, Wkład bydgoskiego ośrodka naukowego do badań nad epoką kamienia w dorzeczu Brdy, (in:) J. Woźny, J. Szalkowska-Łoś, J. Łoś (eds), *XXII Sesja Pomoroznawcza. Od epoki kamienia do nowożytności*, Bydgoszcz, 64–76.