Flint Knapping as a Family Tradition at Bronocice, Poland

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Abstract: By examining flint artifacts, we investigated Funnel Beaker households at Bronocice, Pińczów district and the development of flint knapping as a family tradition. Lithic data, raw materials and production debris, are reflections of social changes that occurred in the settlement. Flint workshops and a bakery were investigated and flint types, tool diversity and volume of debitage compared. Trade in lithic materials is indicated by exotic flint types from distant sources, however most flint came from a nearby source.

Keywords: lithic traditions, flint production workshops, Neolithic, Bronocice

Introduction

This article presents our interpretation of flint remains from the Funnel Beaker and Funnel Beaker-Baden occupations at Bronocice, Pińczów district, southeastern Poland (Lesser Poland). From the flint artifacts and features we attempt to tell a story how some inhabitants of Bronocice specialized in flint working. It is important to recognize that our interpretation of Funnel Beaker flint knapping depends on how one looks at the data.

The State University of New York at Buffalo and the Polish Academy of Sciences conducted a cooperative archaeological project at the Bronocice site, from 1974 to 1978 (Fig. 1). The Director and Principal Polish investigator of this cooperative project was Witold Hensel and Sarunas Milisauskas was the Principal American investigator. The objectives of this archaeological project were twofold: 1) to investigate the prehistoric environments, chronologies, economies, settlement systems, and social organizations of the Middle Neolithic Funnel Beaker and Late Neolithic Funnel Beaker-Baden communities in the basin of the Nidzica River and 2) to demonstrate the origin of complex societies in that region.

The chronological and cultural sequence at Bronocice includes several archaeological cultures. The longest occupations belonged to the Funnel Beaker and Funnel Beaker-Baden cultures (Fig. 2 and Tab. 1). Numerous household pits, human burials, two defensive ditches, and two enclosures for domestic animals were investigated at Bronocice (Kruk and Milisauskas 1981a, b, 1982, 1983, Milisauskas and Kruk 1984, 1989, 2012; Milisauskas *et al*. 2012a, b).

The Neolithic settlement at Bronocice (3900 BC to 2900/2800 BC) existed during a major phase of social and economic transformations (Fig. 1). This period of economic growth and technological advances occurred within the context of long standing social traditions and cultural practices. Continuity and change are evident in the archaeological record as seen in the social and cultural composition of this complex settlement. The lithic materials recovered from two workshops and a bakery serve as examples of specialized trades passed down from one generation to the next. They offer insights in traditional lithic manufacturing practices as well as the consumption of lithic products over time in the face of social and economic changes.

Lithic Orientation

The presence of non-local products and material at Bronocice indicate trade relations with other communities. Non-local ceramics, such as those of the Comb and Pit Ornamented Pottery culture, suggest an interrelationship with populations inhabiting sandy areas east of Bronocice. Faunal and textile data have revealed that the site became a center of trade involving the exchange of livestock and textiles. There

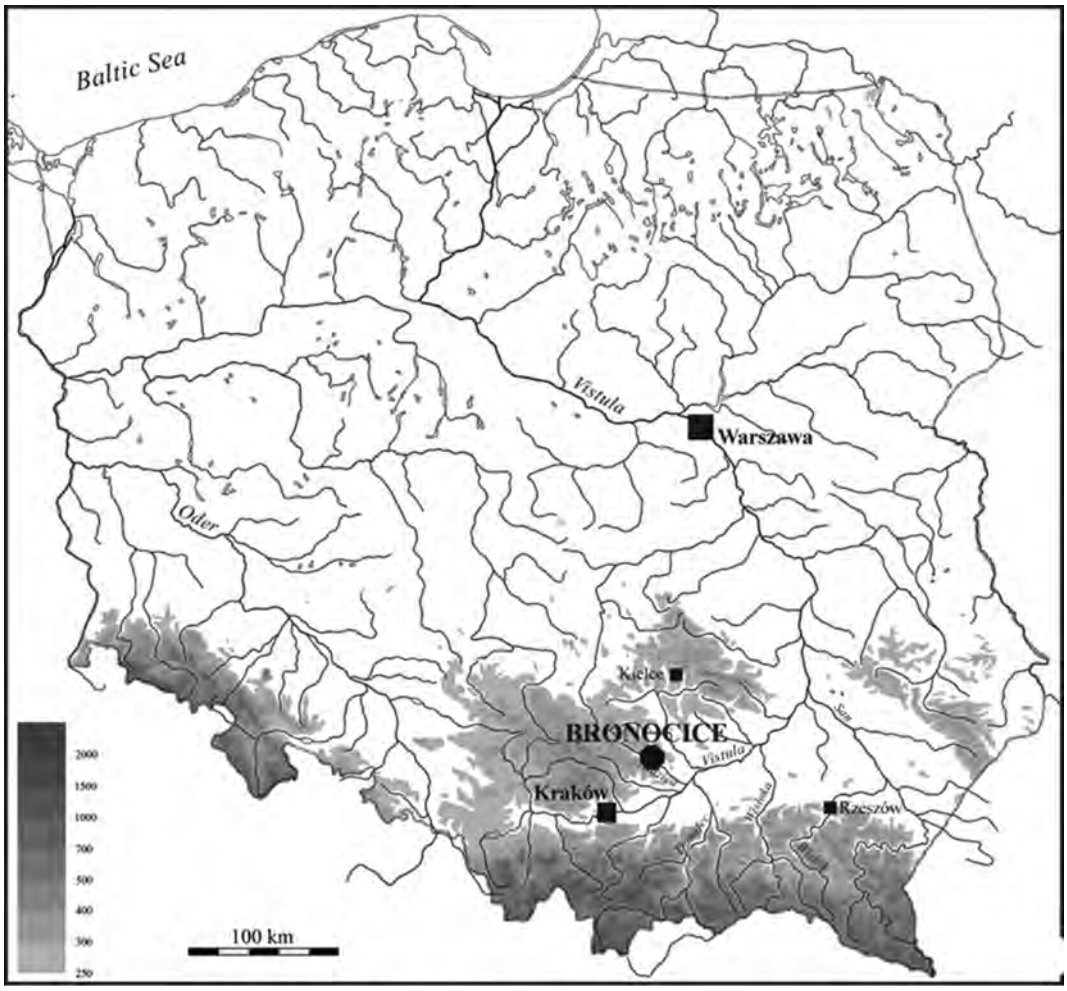

Fig. 1. Map of location of Bronocice, Pińczów dist. Drawn: I. Jordan

are different varieties of flint that suggest the presence of an extensive exchange system (Kruk and Milisauskas 1989). For example, Jurassic flint from the Cracow area, flint from Volhynia in Ukraine, banded (striped) flint from Krzemionki, Świeciechów (gray white-spotted) flint from the Annopol area, and 'chocolate' flint from the Radom area were exchanged between the Funnel Beaker settlements. These varieties of flint are found hundreds of kilometers away from their sources. Jurassic flint was mainly exchanged among Funnel Beaker communities within 100km radius of Bronocice, for this flint is very rare or absent at those sites which are located 100km from Bronocice. The relatively high frequencies of the Świeciechów flint tools found at different sites indicate that they were considered to be a prized possession and were traded more extensively among the Funnel Beaker communities. For example, Gródek Nadbużny, Hrubieszów district, is located 140km from the Świeciechów flint source, but 10% of its flint artifacts were made from this raw material. Settlements located near the flint sources, such as Ćmielów, Ostrowiec Świętokrzyski district, Poland, have much higher frequencies of flint debitage in their lithic assemblages than those farther away. Bogdan Balcer (1975) refers to such settlements as 'production settlements'.

Lithics

Lithics are one of the most durable artifact materials. Nearly indestructible, their presence at most prehistoric sites emphasizes their economic and functional importance to ancient societies. Southern Poland is a geologic area rich in lithic resources. Control over access to lithic resources has been recognized based on the locations of large settlements nearby, e.g., the early Neolithic site of Olszanica, Cracow district was located at a Jurassic flint mine indicating control over access (Lech 1981; Milisauskas 1986). That these people traded with others who likely came to obtain finished products is seen in the presence of non-local ceramics, obsidian and stone tools found inside some of the houses (Milisauskas 1986; Pelisiak 2008). Olszanica's flint found its way to Early Neolithic communities in Poland, the Czech Republic and Slovakia (Kaczanowska and Kozłowski 1976; Lech 1989, 2008). Another major

Table 1. Chronology, cultural sequence, settlement size and population estimates at Bronocice, Pińczów dist.

Phase	Culture and Phase	Dates BC Calibrated	Settlement size	Population estimates
1 (BR I)	Funnel Beaker	3900-3800	2 ha	48
2 (L-V)	Lublin-Volhynian	3800-3700	2.4 ha	57
3 (BR II)	Funnel Beaker	3700-3400	8 ha	I92
4 (BR III)	Funnel Beaker	3400-3100	21 ha	504
5 (BR IV)	Funnel Beaker-Baden	3100-2900	26 ha	624
6 (BR V)	Funnel Beaker-Baden	2900-2700	17 ha	408

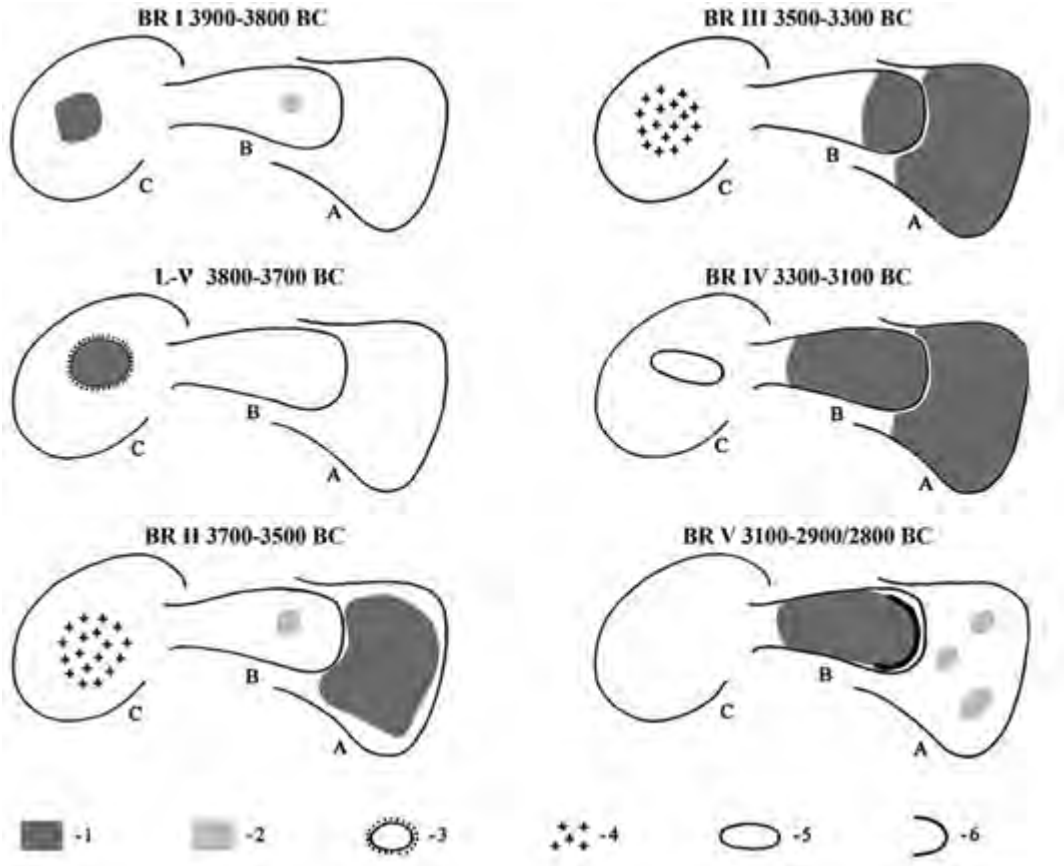

Fig. 2. The development of Neolithic settlement on the elevation 'Baski' at Bronocice, Pińczów dist. Areas A, B, and C were investigated at the highest points of elevations in BR I–V, L–V phases. Key: 1 – Bronocice settlement; 2 – dispersed settlements; 3 – Lublin–Volhynian fortified settlement; 4 – Funnel Beaker cemetery phases BR II – BR III; 5 – Funnel Beaker–Baden (BR IV) enclosure at the highest point of area C; 6 – fortification ditch of phase BR V on the highest point of area B. Drawn: I. Jordan

flint mine was at Krzemionki, Ostrowiec Świętokrzyski district in southeastern Poland, initially exploited by Funnel Beaker community at Ćmielów, Ostrowiec Świętokrzyski district (Balcer 2002; Bąbel *et al.* 2005; Piotrowska *et al.* 2014). Balcer (1995) notes that the inhabitants of this site produced mostly preforms of axes. Such settlements located near specific resources, such as flint, provided them with an opportunity to practice a degree of economic specialization.

Lithic data, including raw materials, finished artifacts, and production debris are reflections many of the social changes that occurred at Bronocice. Over time there were shifts in frequencies of lithic materials,

the acquisition of finished tools *via* trade and the manufacture of lithic tools in the settlement. The people of Bronocice were thrifty and managed their resources economically. Many of the flint chips from the production of tools, especially of axes, show signs of use. Some tools were made from broken or used pieces, e.g., endscrapers made from broken retouched blades. Multiple function tools were also found such as endscrapers/sickle blades. Most of the cores were of Jurassic flint, though they were not numerous, and were small and heavily used. There were also Jurassic pre-cores and reduction flakes. Most lithic artifacts were made of Jurassic flint. The source of this flint was closest to Bronocice, located approximately 35–40km away (Tab. 1).

Specific types of flints were associated with certain types of tools and artifacts. Most burins, sidescrapers, and perforators were made of Jurassic flint. A few perforators were produced of Świeciechów flint. Most retouched blades, sickle blades, endscrapers and axes were made of both Jurassic and Świeciechów flints (Figs. 3, 4 and 5). Some sickle blades were of Volhynian flint and some axes of banded flint (Fig. 6).

Beginning in Phase 3 Świeciechów flint became the second most abundant type used for making tools after Jurassic flint (Fig. 7). Chocolate flint became the least common type of flint after Phase 3, while banded flint first appeared during this Phase. Volhynian flint rarely occurs after Phase 3. The rise in importance of Świeciechów flint may indicate a shift in economic trade relations.

Settlement Description

A description of the architectural, cultural and economic features of Bronocice provides the context in which the lithic workshops and bakery families operated. One of the most striking features of Bronocice is the development of increasing internal spatial complexity over the course a thousand years.

Bronocice is the site of two sequential Funnel Beaker occupations. The first was located in the western

Table 2. Approximate distances from Bronocice, Pińczów dist., to flint sources.

Flint Type	Distance (km)	Direction and location
Jurassic	35	West, Cracow area
Banded	105	Northeast, Krzemionki area
Świeciechów	135	Northeast, Annapol area
Volhynian	270	East, Volhynian in Ukraine
Chocolate	110	Northeast, Radom area

Fig. 3. Jurassic Flint from Bronocice, Pińczów dist. Photo: S.Milisauskas

Fig. 4. Świeciechów flint blades from Bronocice, Pińczów dist. Photo: S. Milisauskas

Fig. 5. Jurassic (left and center) and Świeciechów (right) flint axes from Bronocice, Pińczów dist. Photo: S. Milisauskas

Fig. 6. Banded flint axes from Bronocice, Pińczów dist. Photo: S. Milisauskas

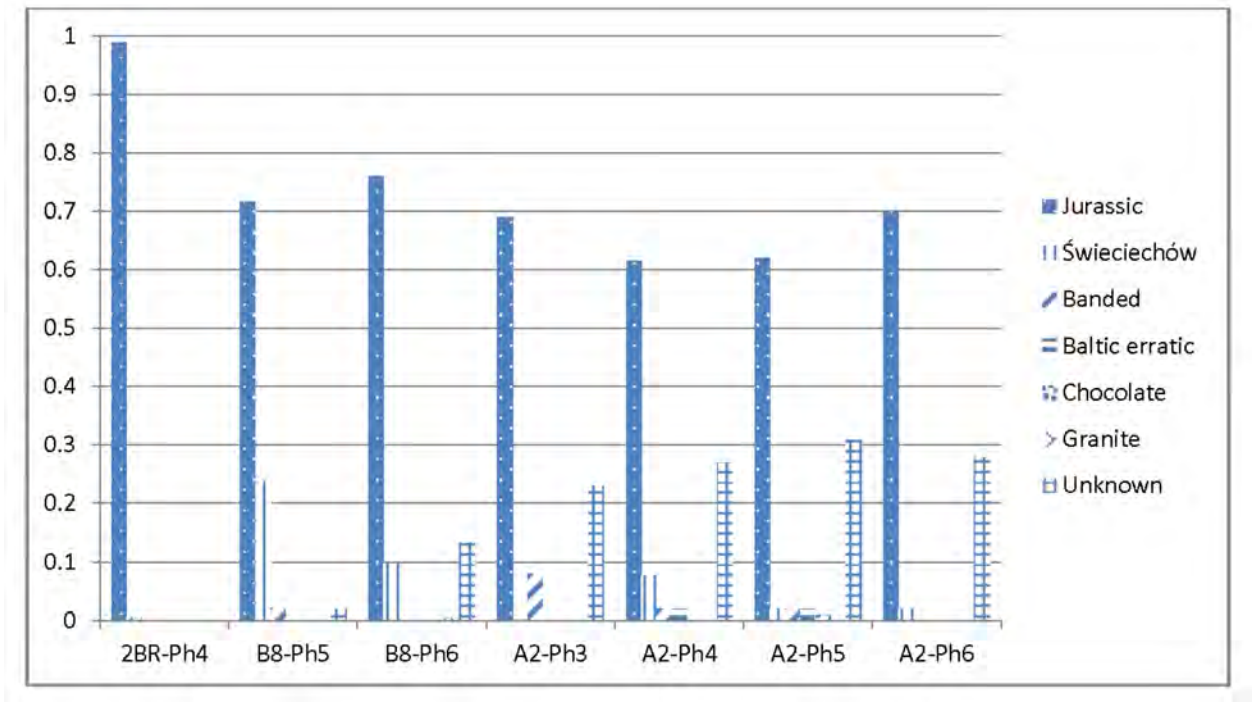

Fig. 7. Relative percentages of flint types by phase of occupation for the entire site. Graphic designer: M.-L. Pipes

portion of the site, while the second was located in the eastern portion of the about 1 kilometer apart (Fig. 8). There is a temporal break of 50–100 years or so between them, interrupted by a Lublin-Volhynian occupation situated on the first Funnel Beaker settlement. This article focuses on the development of the second occupation in Areas A and B.

The first settlement was a small hamlet similar to many hundreds others in the region, dating to 3900 BC. This settlement was distinguished by a few structures and a cemetery. Around 3800 BC a group of Lublin-Volhynian people settled at the same location. This cultural group marked the landscape by building an impressive ditch and palisade around their settlement. The construction of the fortification had important consequences for the subsequent Funnel Beaker settlement. Many Funnel Beaker settlements were occupied by small extended family groups and the sites abandoned after one or two generations. With the disappearance of the Lublin-Volhynian group, not only did the settlement expand, it became heavily involved in long distance trade of commodities among which were textiles, livestock, lithics, salt, and likely other goods for which no evidence is extant.

As the settlement expanded over time, neighborhoods developed and some areas became associated with specialized activities (Pipes *et al.* 2014a–c). Key areas in and around the settlement included the animal enclosures, a weavers area, cultivation fields, lithic workshops and a bakery (Pipes *et al.* 2014a–c). The animal enclosures were critical economically. They were used to hold imported livestock from outside the region. These animals were then traded to outlying settlements (Pipes 2014). The power to enclose large numbers of animals gave Bronocice a strategic economic advantage over other settlements. The presence of the enclosures is a good indicator of control over labor, and the organization of time and energy and by default reveals the existence of a developing social hierarchy.

A significant part of the economic life of Bronocice lay in fiber and textile production (Pipes *et al.* 2014c). A very large assemblage of artifacts associated with spinning fibers and weaving textiles was recovered during the excavations. These artifacts were primarily concentrated in one area of the site and dated from Phase 3 to 6. In spite of a reduction in the size of the settlement during the last phase of occupation, the volume of fiber and textile production artifacts remained high indicating that production and trade of textiles continued to be economically important.

The lithic workshops and the bakery were located outside of the main community. One workshop was located along the dirt road on the northern edge of the settlement, while the other was located in Unit B8, an area located to the south of the center of the settlement. The bakery was found in Unit A2.

By 3700 BC Bronocice had arisen as the dominant political and economic body in the area (Milisauskas and Kruk 1984, 1989). The increasing volume of flint artifacts from household deposits dating to the period suggests the presence of lithic specialists serving the needs of the community.

Around 3500 BC a flint specialist was producing high quality flint blades. This workshop was located in Area B (Pit 2B–road). A small variety of other tools were also made most of which were of Jurassic flint. Around 3300 BC axes were being produced in high numbers by another specialist located in Area B8. Based on several thousand axe flakes it has been estimated that approximately 102 axes were reflected in a single deposit from Phase 5.

The bakery was located at a distance from the main part of the settlement, perhaps due to fear of fire. The ovens were rebuilt several times from 3500–2900 BC. This is only the location at the site at which large ovens were discovered during excavations. Because of the uniqueness of these features it appears that bread baking was a controlled activity. The consumption of fuel may have been an important factor. At this point in time it is difficult to determine if individual households made their bread at home then brought it to the bakery for baking, or if bread was made at this location as a commodity for the community.

The great length of time during which the bakery existed made it an excellent case study for examining the consumption and use of lithic tools. It is not unlikely that the tools recovered from the bakery were obtained from lithic workshops in the settlement, though not necessarily from the two described here. It is worth mentioning that since only one percent of the site was sampled other lithic workshops were probably in operation at Bronocice as well.

Data Analysis

The lithic assemblages from the workshops and the bakery were examined and compared by flint types, range of tools and volume of debitage. Most likely the inhabitants of Bronocice identified the stone tools based on what they were for, where they were used, or who used them. In order to facilitate comparisons between locations and lithic compositions the artifacts were classified by group and class designations. Groups were used to separate artifacts into Tool Production and Tools. Classes were used to separate Tools by function, which were further delineated by lithic material. Within

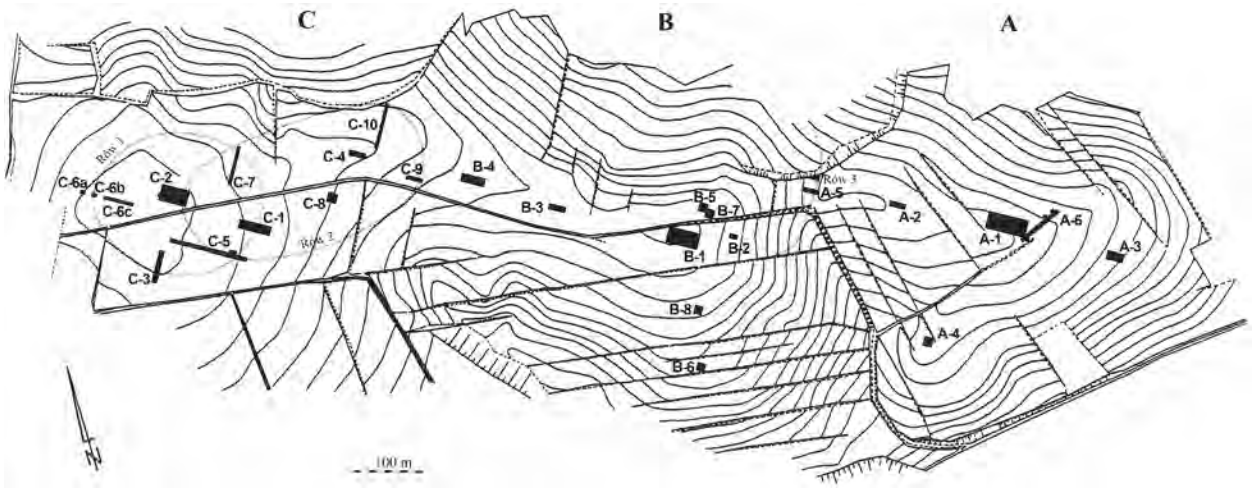

Fig. 8. Site plan of the excavations at Bronocice, Pińczów dist. Lithic workshops were located in units Bd and B8, and the bakery in A2. Drawn: I. Jordan

Table 3. Summary of tool production and tools by group and class and by location and phase.

Group	Class	Object	Lithic Material	Phase 4 #
Tool Production	Usage Material	Core	Jurassic	2
Subtotal				**2**
	Debitage	Flake	Jurassic	5108
			Świeciechów	25
			Banded	2
Subtotal				**5135**
Tool	Digging	Pick	Jurassic	1
	Cutting	Blade	Jurassic	78
			Unknown	1
		Retouched Blade	Jurassic	5
			Świeciechów	2
		Retouched Flake	Jurassic	3
			Unknown	1
	Scraping	Sidescraper	Jurassic	1
	Pounding	Hammerstone	Jurassic	2
	Chopping	Axe	Jurassic	5
	Unknown	Unknown tool	Jurassic	16
			Świeciechów	1
			Unknown	1
Subtotal				**117**
Lithic Total				**5253**

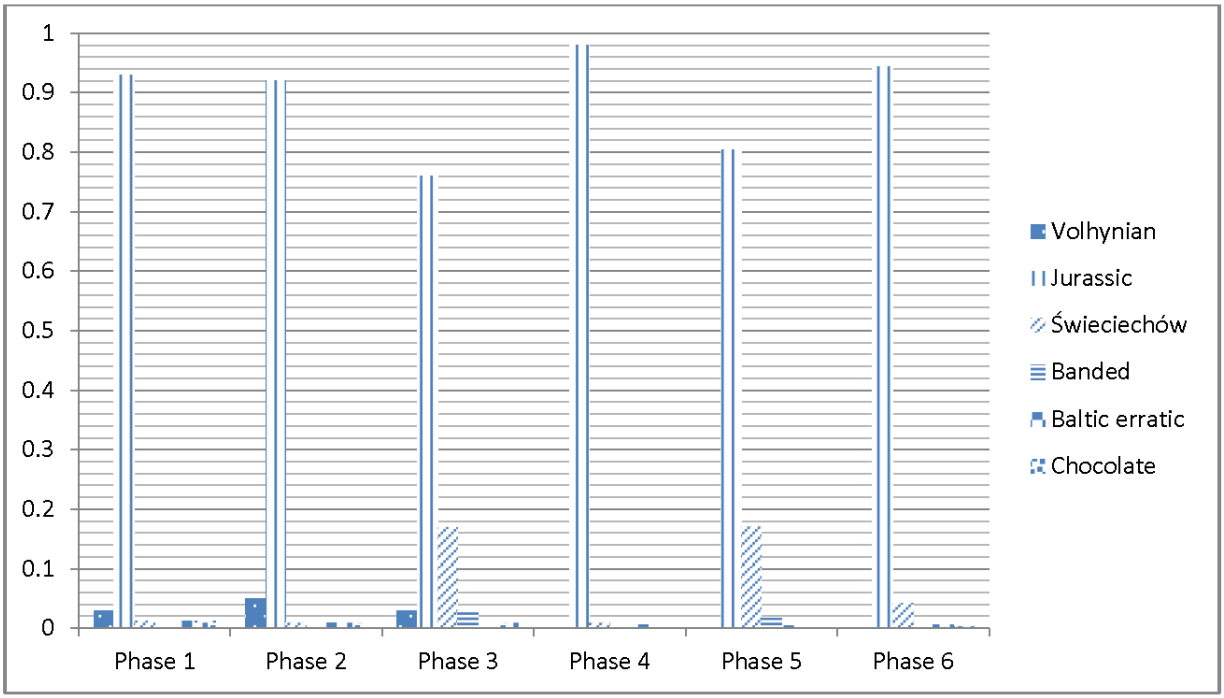

Fig. 9. Relative frequencies of flint and other lithic material types by location and phase of occupation. Graphic designer: M.-L. Pipes

the Tool Production group there were two classes of artifacts: raw materials consisting of cores and debitage consisting of chips and flakes. In the Tool group there were several classes of artifacts which included: digging, drilling, cutting, scraping, pounding, chopping, weapon and tools of unknown function. Debitage was the most frequent class within Tool Production artifacts, while cutting was the most frequent class within Tools (Tab. 3). The latter included blades, retouched blades and retouched flakes. The great majority of all artifacts found at the two workshops and the bakery were made of Jurassic flint.

Lithic Workshop, 2B–road – Phase 4

The lithic workshop associated with Pit 2B–Road was found along the dirt road in Area B and dates to Phase 4. The majority of artifacts were recovered on the floor of the pit. A child's skeleton was also found on the pit floor. It would appear the pit was reused as a burial chamber after the structure was no longer inhabited (Fig. 10). The workshop at this location contained a lithic deposit composed of a great majority of debitage flakes, approximately 98 percent (Tab. 4). With the exception of a few Świeciechów and banded flint flakes all of the debitage was Jurassic flint. Two Jurassic flint cores were present as well.

Tools included digging, cutting, scraping, pounding, and chopping artifacts. An overwhelming majority of the lithic tools were made of Jurassic flint (Fig. 9). A few tools were made of Świeciechów flint. While some banded flint debitage was identified no tools were present of that material. Cutting tools were the most frequent class, among which blades were the most abundant. The high frequency of blades suggests that this was the main tool type produced. One Świeciechów retouched blade was present. Other tools were present in the deposit such as axes, hammerstones, a side scraper and a pick, as well as expedient tools made of retouched flakes. A fair number of tools were unidentified because they were broken. There was a relatively high number of Jurassic flint axes well suggesting they were also being produced at this workshop.

Lithic Workshop, Unit B8 – Phases 5 and 6

A second lithic workshop was found in Unit B8. Excavations at this location revealed the remains of two houses spanning phases 5 and 6, and consisting of several pits. The location of this site on the periphery of the settlement as well as the internal complexity of the structures suggests it was near cultivated fields. A large lithic assemblage was found associated with the Phase 5 structure and pits. The later structure yielded a much smaller lithic assemblage. The deposits associated with the earlier structure were clearly generated by a lithic workshop. This workshop had a more expansive range of tool types produced though it was focused mainly on axe and blade production (Fig. 11, Tab. 3). The pits were

Fig. 10. Lithic workshop pit in 2b–road. Flakes were distributed across the floor of the cellar pit. Photo: S. Milisauskas

Table 4. Summary of lithic materials from 2–BR, the Phase 4 lithic workshop.

Group	Class	Object	Lithic Material	Phase 4 #
Tool Production	Usage Material	Core	Jurassic	2
Subtotal				**2**
	Debitage	Flake	Jurassic	5108
			Świeciechów	25
			Banded	2
Subtotal				**5135**
Tool	Digging	Pick	Jurassic	1
	Cutting	Blade	Jurassic	78
			Unknown	1
		Retouched Blade	Jurassic	5
			Świeciechów	2
		Retouched Flake	Jurassic	3
			Unknown	1
	Scraping	Sidescraper	Jurassic	1
	Pounding	Hammerstone	Jurassic	2
	Chopping	Axe	Jurassic	5
	Unknown	Unknown tool	Jurassic	16
			Świeciechów	1
			Unknown	1
Subtotal				**117**
Lithic Total				**5253**

Table 5. Summary of lithic materials from Unit B8, the Phase 5/6 lithic workshop.

Group	Class	Object	Lithic Material	Phase 5 #	Phase 6 #
Tool Production	Usage Material	Core	Jurassic	18	2
			Banded	2	-
			Unknown	5	-
Subtotal				**25**	**2**
	Debitage	Flake	Jurassic	2059	107
			Świeciechów	711	15
			Banded	60	-
			Chocolate	4	-
			Unknown	53	21
Subtotal				**2887**	**143**
Tool	Digging	Pick	Jurassic	3	2
	Cutting	Blade	Jurassic	39	8
			Świeciechów	6	1
			Banded	1	-
			Unknown	2	-
		Retouched Blade	Jurassic	11	2
			Banded	1	-
		Retouched Flake	Jurassic	5	1
			Świeciechów	2	-
			Unknown	1	-
	Scraping	Side Scraper	Jurassic	5	-
		End Scraper	Jurassic	2	-
	Pounding	Hammerstone	Jurassic	3	2
			Granite	1	-
			Unknown	-	1
	Chopping	Axe	Jurassic	9	-
			Banded	1	-
			Unknown	-	-
	Weapon	Projectile Point	Jurassic	1	-
	Unknown	Unknown	Jurassic	2	1
			Świeciechów	1	-
			Subtotal	97	18
Lithic Total				**3009**	**164**

rich in debitage, cores and tools. One pit in particular appears to have been the location where cores were stored (Pit 7–B8), while the main cellar in the structure was the work area (Pit 1–B8). This large cellar floor yielded cores and the majority of debitage. Much of the debitage was related to axe production (Tab. 5). Most of the cores and debitage were of Jurassic flint (Fig. 12). A large amount of Świeciechów flint debitage was also present though no core was recovered.

A wide variety of tools were present including a pick, blades, retouched flakes and blades, a sidescraper and endscrapers, hammerstones, axes, and a projectile point (Tab. 5). Blades were the most abundant tool in the assemblage, mostly made of Jurassic flint. But there were also blades of banded and Świeciechów flints. Most other tools were also made of Jurassic flint. The great range of tools reflected in the assemblage may

Fig. 11. Broken polished stone axe recovered from the Phase 5 workshop in Unit B8. Photo: S. Milisauskas

Fig. 12. Jurassic core from the Phase 6 structure in Unit B8. Photo: S. Milisauskas

have been partly related to other activities that took place at this workshop.

The later phase occupation was characterized by a much smaller lithic assemblage. As with the earlier structure Jurassic cores were recovered from the Phase 6 deposits. The volume of debitage was notably smaller. Most of the debitage was composed of Jurassic flint though Świeciechów flint was also represented.

There was far less diversity of stone tools. These included a pick, blades, hammerstones, and an axe. Earlier there was a greater diversity of flint types including Jurassic, Świeciechów, banded and chocolate flint, whereas in the later phase only Jurassic and Świeciechów flints were present (Tab. 5).

This suggests continuity in tool production even though it was diminished in comparison with the earlier workshop. This may be due partly to data recovery issues since only part of the later structure was excavated. This period coincides with the decline in size and population of Bronocice. Like the workshop at 2B–road, the partial remains of an adult human were found in association with the lithic specialist assemblage. The layout of the two structures, their proximity, and the similarity in lithic assemblages suggests that a long-term lithic tradition was practiced over generations at this location.

A series of large circular wattle and daub features were identified in Unit A2 showing signs of heat exposure (Fig. 13). These features appear to be the remains of large ovens probably for baking bread. Because this is only location at the site where this type of feature was found it is thought that this was a bakery. Communal

Fig. 13. The bakery in Unit A2 – Phases 3–6. Photo: S. Milisauskas

Table 6. Summary of lithic materials from Unit A2, the bakery, Phases 3–6.

Group	Class	Object	Lithic Material	Phase 3 #	Phase 4 #	Phase 5 #	Phase 6 #
Tool Production	Usage Material	Core	Jurassic	1	-	-	1
			Chocolate	-	-	1	-
			Unknown	1	1	1	2
Subtotal				**2**	**1**	**2**	**3**
	Debitage	Flake	Jurassic	6	19	42	53
			Świeciechów	-	3	1	-
			Banded	1	-	2	-
			Baltic Erratic	-	1	2	-
			Unknown	2	11	24	25
			Subtotal	9	34	71	78
Tool	Drilling	Burin/Borer	Jurassic	-	-	3	3
			Banded	-	1	-	-
	Cutting	Blade	Jurassic	1	4	5	4
			Unknown	-	-	3	2
		Retouched Blade	Jurassic	-	2	4	1
			Unknown	-	-	-	1
		Retouched Flake	Jurassic	1	5	7	8
			Świeciechów	-	1	-	1
			Unknown	-	-	3	-
	Scraping	Side Scraper	Jurassic	-	-	-	1
		End Scraper	Jurassic	-	-	1	1
			Świeciechów	-	-	1	-
	Pounding	Hammerstone	Unknown	-	1	-	-
	Chopping	Axe	Jurassic	-	2	-	-
			Unknown	-	1	-	-
	Unknown	Unknown	Jurassic	-	-	2	2
			Świeciechów	-	-	-	1
			Unknown	-	-	1	-
Subtotal				**2**	**17**	**30**	**25**
Lithic Total				**16**	**51**	**103**	**106**

bread baking was a common practice in parts of Europe until the twentieth century. Women brought their bread to be baked in a communal oven once a week. The ovens span multiple phases of occupation at Bronocice, Phases 3–6. The ovens were rebuilt many times. The lithic artifacts from this location provide insights into the likely consumption and use of tools made by specialists at Bronocice.

Unlike the two workshops, in which debitage was the most frequent category, it was far less abundant at the bakery. Tool re-sharpening most likely accounts for the presence of low frequencies of debitage. Tools related to cutting were the most abundant tool class (Tab. 6). Stone tools were made primarily of Jurassic flint of Świeciechów. The Phase 5 assemblage exhibited the greatest diversity of lithic materials (Fig. 9). By this point in time the settlement had reached its zenith and greatest cultural diversity. Therefore it is not surprising that the lithic assemblage reflected variety as well.

It is worth mentioning that this pattern of consumption suggests the presence of other lithic specialists who produced tools of Banded and Świeciechów flints. Tab.

6 summarizes the lithic artifacts from deposits by phase of occupation. The earliest phase has the least amount of material while the last phase yielded the greatest volume. Tools included burins and drills, blades, retouched flakes, sidescrapers, endscrapers, axes, and a hammerstone. It is interesting to note that there were. relatively few axes, since a bakery would have required a lot of fuel in the form of wood to heat the ovens.

Summary

The site of Bronocice is not the first to suggest the presence of lithic specialists. Specialized production sites such as Ćmielów, located near mines, have been known for a long time as having individuals buried with special lithic tool kits, for example such as was found at Michałowice, Cracow district, a Pleszów phase of the Lengyel culture (Lech 1981). Such people were skilled specialists. 'Manufacturing macrolithic blades required a high skill and specific tools. Also production of axes was by no means an easy task, accessible only for a few skilled persons' (Balcer 2002: 171).

At Bronocice, the two workshops and the bakery represent different aspects of the community involving local people. The three locations were similar in being places at which goods were produced. The lithic workshops produced tools in excess of what their households would have consumed. From Phase 3–6 the nature of blades and axes produced at Bronocice varied little. The workshops both produced axes and blades in addition to a variety of other tools. The earlier workshop at 2B–road was more limited in terms of the range of products produced. The later workshop in Unit B8 produced more diversified tools. Against a backdrop of cultural changes at least one of the lithic workshops continued to produce the same basic types of tools.

The occupation associated with the workshop in unit B8 lasted from a period of time during which the settlement was at its peak in terms of physical size and population through the end of the settlement when it shrank to a smaller size. The reduction in lithic materials, both raw materials and finished products, may be a reflection of a decreased market for lithic tools within the community. It is assumed that the property belonged to a family and was occupied over multiple generations by descendants of the first lithic specialist.

At the bakery, the composition of the lithic artifacts dating to four distinct phases of occupation gives some understanding of lithic use. There is some evidence that tools might have been made since two cores were found. But the range of tools overall was small, primarily consisting of cutting tools. Surprisingly absent were axes.

The lithic assemblage at the bakery did not diminish in volume over time. Instead it was larger during the last phase than the earlier three phases of occupation. Cutting tools were the most frequent of any tool type. The production of bread at this location throughout the entire span of occupation in the eastern portion of the site appears to have remained constant. The increasing size of the lithic assemblage may in fact be a testament to the growing importance of the bakery in the community. There are many metaphors about bread being the staff of life that have survived from prehistory. It is easy to imagine the importance of this food within the community. Like the property in Unit B8, it is assumed that the property in Unit A2 was owned by a family and occupied subsequently by descendants. The continuation of the large ovens at this location suggests that this was a long lived family enterprise.

However, there was a decrease in the variety of lithic types by Phase 6 reflecting the same shift seen in the Phase 6 deposits in Unit B8. There developed a primary reliance on Jurassic flint for making tools. Clearly this was a pattern that happened everywhere in the settlement. This reliance of Jurassic flint may be seen as a retraction of Bronocice extensive trade relations and intensified concentration on economic exchanges within the region. Throughout the settlement's history tools had been dominated by Jurassic flint. It appears in the last phase that trade did not actually diminish but instead became more localized. Perhaps surrounding the growing influence and power of Baden communities usurped Bronocice's economic trade network blocking access to former trading partners from whom they used to obtain non-local exotic flints.

In conclusion, the data offer some insights into the lives of three households and the long-term production and use of lithic materials.

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