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NEW INSIGHTS INTO THE USE OF “IMPORTED” FLINT RAW MATERIALS IN THE YOUNGER PHASES OF THE FUNNEL BEAKER CULTURE IN THE STAROGARD LAKE DISTRICT

ABSTRACT

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In recent years, the region of Starogard Lake District in northern Poland has seen a growing interest in the Funnel Beaker culture, including the research on local flintworking, which has fed the discussion on the traffic in “exotic” flint in the younger phases of the Funnel Beaker settlement in the region (3650-3100 calBC). In this study, lithic assemblages from the Starogard Lake District are screened for “imported” flint artefacts to determine the parent rock material used for their production and monitor their frequencies in the local assemblages. By exploring the use-wear analysis results, we also investigate the production and consumption patterns of the local and “imported” flint artefacts from the Chełmno land and the Starogard Lake District. The obtained results were confronted with comparative data from other parts of the Eastern Group and confirming the marginal position of the Eastern Pomerania region in the “exotic” flint trading network during the Funnel Beaker era in Poland.

Keywords: Neolithic, Funnel Beaker culture, Eastern Pomerania, flint, imported flint raw material

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INTRODUCTION

In 2021 fifty years have passed since the publication edited by Janusz Krzysztof Kozłowski: “Z badań nad krzemieniarstwem neolitycznym i eneolitycznym (Referaty i komunikaty przedstawione na sympozjum w Nowej Hucie dn. 10, 11 maja 1971)” (in English: “Studies on the Neolithic and Eneolithic flint industries [Papers and reports presented during the Symposium held in Nowa Huta, 10th-11th May 1971]”). The appearance of this scientific work has generally been considered a significant turning point in the development of studies upon Neolithic flintworking. Both the symposium itself and the publication of research papers from it became seen as: “... an expression of the constitution of the Neolithic flint processing studies as an independent scientific research direction, having at its disposal a separate category of archaeological data, specific research methods, most of which were adopted from the Palaeolithic archaeology, as well as characteristic research goals that expand our knowledge on the New Stone Age...” (Lech 2000, 178). The issues raised at the Symposium represented, without any doubts, a brand-new quality in the lithic industries studies from the New Stone Age on the European scale. This event provided an opportunity to summarise the preliminary stage of studies in this respect and identify research problems, which have not lost their significance until the present, including the issues of acquisition, processing, and distribution of lithic raw materials (Kozłowski 1971, 139-146; Lech 2000, 178). The problems of the obtaining and circulation of siliceous rocks in the Neolithic are also widely studied in European archaeology (from more recent studies, *e.g.*, Kerig, Shennan 2015; Bostyn, Denis 2016).

One of the co-authors of the publication mentioned above, J. K. Kozłowski, stated as follows: “The investigations on interregional contacts in the New Stone Age are mostly based on stylistic premises expressed in forms and decoration of pottery. In fact, ‘imported’ lithic artefacts can provide more objective and conclusive evidence for interregional contacts than those seen through the influences and imports of ‘ceramic’ styles” (Kozłowski 1971, 139).

In 2019, while undertaking studies on the distribution of mined raw materials in the FBC eastern group, we concluded: “For nearly 100 years, pottery is the major source, based on which the division into archaeological cultures and their derivatives (phases, groups, stylistics, *etc.*) has been performed, recognised as prehistoric variability in the real culture. This variability of culture, settlement and economic issues, and cultural affiliations of other categories of artefacts have all been considered through the context of pottery. This simplified picture of a common archaeological practice applied in most investigations on the Neolithic and the successive periods (*cf.* Kukawka 1997, 16, 17). In this paper, we would like to attempt to confront the viewpoints based on the observed variability in pottery with the context of co-occurring flint artefacts, which are still, in our opinion, strongly underestimated in compiling publications on the Neolithic Age” (Adamczak, Kukawka and Małecka-

Kukawka 2019, 176). From these, one may conclude that despite a growing interest of archaeologists in the Neolithic flint processing and a significant increase in the number of source data in this respect, the prehistoric fundamentals postulated by J. K. Kozłowski 50 years ago are still valid.

In the paper mentioned above published in 2019, we addressed the issue of “imported” flint artefacts in the younger phases of the FBC eastern group. We also underlined an unequal state of knowledge not only of this particular flint industry, but the Funnel Beaker culture within the extent of its eastern group in general, stressing that along with the increase in the amount of data, we would expect the picture of particular regions to look different than it might have seemed. This especially concerns the region of Eastern Pomerania, which has yielded a substantial flint collection (1364 artefacts) but was entirely excavated at site 9 in Barłożno (Adamczak, Kukawka and Małecka-Kukawka 2019, 177-181).

In 2020 another scientific work was published, namely “Wczesny i środkowy neolit na Pojezierzu Starogardzkim w świetle badań nad dolną Wierzycą i Janką” (in English: “The Early and Middle Neolithic in the Starogard Lake District in the context of investigations carried out along the Wierzyca and Janka Rivers”) edited by Olgierd Felczak. This book encompassed the outcomes of analyses on flint materials from the sites Rożental 1, Pelplin Maciejewo 20 and Brody Pomorskie 20 (three zones, discussed separately; Małecka-Kukawka 2020, 227-268; see: fig. 1 and tab. 1). This significant increase in the number of data inspired us to continue our studies upon the distribution issues of “exotic” lithic materials in the younger phases of the FBC eastern group, and confront them with the results presented in 2019.

In the present paper, we have adopted “older and younger FBC” as chronological determinations. They refer to chronology based on pottery variability, supported by radiocarbon dates (for the Chełmno land, *cf.* Kukawka 2010, and the Starogard Lake District, *cf.* Felczak 2020). The older FBC corresponds with ceramic assemblages with no “zig-zag” decoration (conventional phases I-III A in the Kuyavian periodisation, according to A. Kośko 1981). While the younger FBC refers to pottery with “zig-zag” motif (from the so-called classical and late Wiórek phase), and other younger assemblages (in general, from the Luboń phase, or containing elements of the Luboń stylistics; conventional phases IIIB-V in the Kuyavian scheme, according to A. Kośko 1981). Based on radiocarbon determinations for the Chełmno land, these two styles of pottery decoration (*i.e.*, with or without “zig-zag” motifs) are separated at *ca.* 3700/3600 calBC (Kukawka 2010). O. Felczak addresses the characteristics of the agglomeration of the FBC settlement in the Starogard Lake District throughout the 4th millennium BC. However, the most comprehensively analysed lithic materials from the Starogard Lake District should be dated to the younger period, that is 3650/3600-3100/3000 calBC, which corresponds with the classical and late Wiórek phase (Felczak 2020a, 95-186; 2020b, 187-195).

RESEARCH DESCRIPTION AND METHODS

This paper is essentially a data supplement to the article published in 2019, the research goal of which can be defined as follows:

“The non-local (“imported”) lithic materials under study occurred naturally within the area occupied at those times by the south-eastern group of the Funnel Beaker culture, or within the extent of the Tripolye Culture (TC) (Volhynian flints), [...] the authors aim at verification whether their contribution varied regionally, and was dependent on the distance of their deposition spots from the FBC south-eastern group settlement region, or their original outcrops. A few hypotheses will be put to the test. In our opinion, hypotheses logically result from the viewpoints based on analyses of pottery. Thus, intense relationships in terms of pottery resemblance with the FBC south-eastern group should correlate with an increased contribution of all, or some at least, raw materials. This is since all of them occurred at the sites in question, though in various proportions, identified as the FBC sites. The process of Eneolithisation incoming from the TC environment (the Mątwy group; Koško 1981) should have increased the Volhynian flints’ contribution. On the other hand, the Eneolithisation associated with the Baden culture (Badenisation process) coming mostly from the west, according to opinions of scholars interested in the Kuyavia region (Przybył 2009, with further references), should be characterised by a decrease in the share of “imported” flints within assemblages uncovered at the sites where this cultural phenomenon was recorded. The situation should be similar concerning intensified relationships with the North-Eastern European Subneolithic (Kukawka 2010, with further references)” (Adamczak *et al.* 2019, 176).

The presentation of new data from the Starogard Lake District given in this paper follows the principles adopted in our article published in 2019: [1] the analyses covered flint assemblages exclusively from the remains of settlements; [2] our calculations excluded charred flints to maintain the analytical comparability; [3] we decided not to divide erratic flints that occur locally in Polish Lowlands into “erratic Baltic flint, variant I” and “Pomeranian flint”, which seems to be well justified from the perspective of established research goals. The issue of other factors, of science or beyond-science nature, which could have affected the frequencies of “exotic” materials, was discussed in greater detail in other papers (*cf.* Adamczak *et al.* 2017, 295-308; 2019, 175-189).

DATA FROM THE STAROGARD LAKE DISTRICT AND OTHER REGIONS

Table 1 presents the raw material structure of flint assemblages coming from sites localised in the Starogard Lake Districts. According to the above-mentioned principles, the numbers given in this table differ from those published by Jolanta Małecka-Kukawka in

Table 1. Raw material characteristics of the FBC flint assemblages from the Starogard Lake District

l.p.	site	nb	jp	cz	św	wol	pas	no	N	references
1	Barłožno 9	100	-	+	-	-	-	-	1364	Adamczak <i>et al.</i> 2019
2	Brody Pomorskie 20 zone I	94	-	+	1	4	-	1	410	Małecka-Kukawka 2020
3	Brody Pomorskie 20 zone II	97	-	1	1	-	-	-	69	Małecka-Kukawka 2020
4	Brody Pomorskie 20 zone III	95	-	+	1	3	-	1	328	Małecka-Kukawka 2020
5	<i>Brody Pomorskie 20 zones I-III + outside zones</i>	95	-	+	1	3	-	1	1008	Małecka-Kukawka 2020
6	Pelplin Maciejewo 20	95	-	-	1	2	-	1	85	Małecka-Kukawka 2020
7	Rożental 1	99	-	+	-	1	-	-	366	Małecka-Kukawka 2020
8	Bielawki 6	100	-	-	-	-	?	?	2036?	Ostasz 2011

nb – Cretaceous Baltic flint and Pomeranian flint, jp – Jurassic Cracow flint, cz – chocolate flints, św – Świeciechów flint, wol – Volhynian flint, pas – striped flint, no – undetermined flint. Other abbreviations: l.p. – ordinal number; N – number of flint artefacts within the assemblage, ? – a number of artefacts are not certain, + - marginal share of raw material, below 0.5%. The list excludes undetermined flints due to their state of preservation (charring).

2020, resulting from the rejection of charred specimens in our analysis. Table 1 also contains data acquired at the site 6 in Bielawki, com. Pelplin (Ostasz 2011, 45-57). The paper presenting the results of investigations carried out at this site reveals only general information about the flint assemblage associated by the author, Maricn Wąs, with the FBC flint tradition (*cf.* Wąs 2016, 55). Despite missing quantitative and qualitative data (including on the technical and morphological structure), we decided to include this collection into our considerations, since in the context of other flint assemblages, even such general information on the raw material structure would be valuable for the reconstruction of the picture of inflow of “exotic” lithic materials into the Starogard Lake District. The site in Bielawki is a multicultural site, where apart from the predominant FBC pottery (“zig-zag” stylistics), there were identified collections of vessels of other characteristics, associated with the late Linear Band Pottery culture, Subneolithic, Globular Amphora and Corded Ware cultures, as well as cultural units from the beginnings of the Bronze Age (Ostasz 2011). A blade of a polished axe made of striped flint was also discovered, which according to the current state of knowledge, should relate to the Globular Amphora culture.

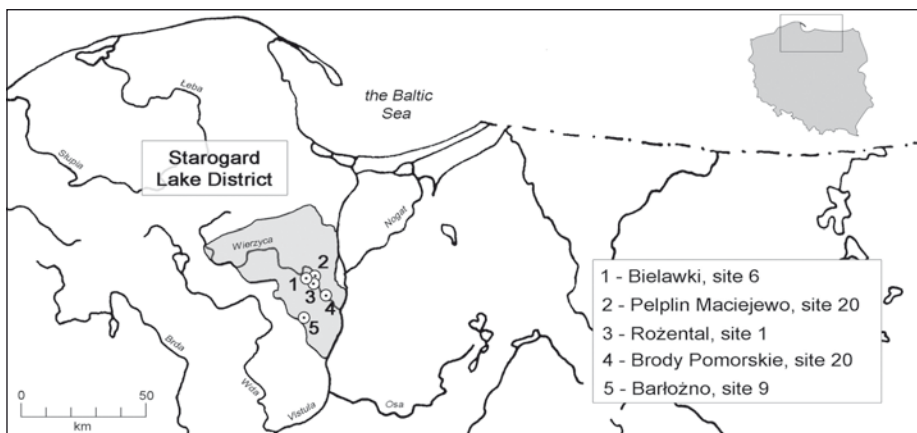


Fig. 1. Map of the Starogard Lake District with the location of FBC sites reported in this study (compiled by K. Adamczak)

Since this paper aims to complement the picture of the distribution of “exotic” lithic materials amongst the communities of the FBC eastern group presented in 2019, we decided to include the related data from other regions and information coming from the Starogard Lake District. In 2019 an article reporting the flint industry in Greater Poland was published (Kabaciński and Sobkowiak-Tabaka 2019, 33-63). However, we decided not to verify the data under analysis with the information presented in this paper for some reasons including, [1] some data from Greater Poland contained within the above-mentioned article comes from papers that we had already discussed in our work of 2019; [2] there is a lack of quantitative information that could be included in our calculations presented in table 2; [3] based on our general evaluation, this new information referring to the structure of raw materials does not verify our previous conclusions (demonstrative, expressed as a percentage).

We have also encountered a typescript of a PhD thesis written by Michał Dobrzyński (2014; online access), which had not been mentioned in our article of 2019. This paper covers the issues of flint processing in the regions of our interest, namely Central Poland and the Gostynin Lake District, and despite the fact that the information presented there would verify the data given in Table 2, in some cases at least, we decided not to include it in our present paper due to the following reasons: [1] the numbers of flint specimens sometimes differ from those given in the source papers; [2] the thesis is not uniform in terms of methodology – some part of collections were analysed once again by the author, whereas the others (obviously, inaccessible to the author) were just quoted from the original literature; [3] in those instances when the author had access to original flint collections published in older articles, his findings in terms of the quantity of assemblages and raw material determinations differed from the conclusions drawn by the first investigators of

those assemblages, due to unknown reasons; [4] we are unable to evaluate the competences neither of the authors of the older papers quoted in the above-mentioned thesis, nor its author himself. Therefore, our article will be based on source publications concerning Central Poland and the Gostynin Lake District. The rightness of our decision is supported by the fact that regional indices of “imported” lithic raw materials are not very varied if we compare our findings with those given by M. Dobrzyński (*e.g.*, the general index of “imported” flints for Central Poland is very similar: 5.4% in our analysis, and 5.0% in the above-quoted PhD thesis; see tab. 2).

To sum up, we have gathered information referring to the frequencies of imported lithic materials from 53 sites of the younger phase of the FBC eastern group (Adamczak *et al.* 2019, table 1 – with source literature, fig. 1 – distribution of sites, as well as table 1 and fig. 1 in the text). Since, in some cases, the authors of these analyses distinguished certain settlement zones within the sites, or classified artefacts based on some other principles, the 53 sites as mentioned earlier are represented by 61 assemblages of flint artefacts. In total, the collection in question enclosed almost 17 thousand artefacts (or nearly 19 thousand if we include the site Bielawki 6; comp. the comments in the text), over 1600 of which were determined by the authors of the source analyses as imported (Jurassic, chocolate, Świeciechów, Volhynian and striped flints).

New information on the structure of raw materials in assemblages from the Starogard Lake District has extended our knowledge of the circulation of mined raw materials in the northern zone of the FBC eastern group. According to the approach adopted in our paper of 2019 (*cf.* Adamczak *et al.* 2019, table 2, 181), from the viewpoint of the occurrence of “exotic” materials, the region of Eastern Pomerania seems to have been peripheral, staying beyond the general distribution system legible in the other areas of the FBC settlement in Polish Lowlands. This statement also concerns Greater Poland, where raw materials from southern Poland or Volhynian flints were marginal. These observations confirmed the relevance of the conclusions formulated by Bogdan Balcer fifty years ago, particularly regarding the flint processing model employed by the FBC communities. This model was based on the flow of lithic materials from flint mines through production and workshop sites, ending at settlements and campsites where the FBC tools were used (Balcer 1971, 52-56). Jacek Lech adopted an identical model for interpreting lithic raw materials in the Linear Band Pottery Complex (Lech 1981, 130-174). Having investigated the flint materials from particular analytical categories of this model, the authors concluded as follows: [1] the further from the points of flint extraction and processing, the less number of artefacts made of “exotic” materials is recorded within the general structure of assemblages; [2] there are significant differences in terms of technical and morphological structure between the assemblages from particular categories of the above-mentioned model; [3] starting from the category of flint extraction and processing points, a high percentage of forms coming from the rejuvenation of artefacts is observed, with commonly applied splintering technique in the core reduction process.

In summary of analyses on lithic materials from Eastern Pomerania, it was concluded as follows:

“The described features of flint processing in the classical FBC phase in the Starogard Lake District correspond well with observations made for lithic materials from other regions of Polish Lowlands [...]. Published results of analyses performed for numerous flint assemblages of the Funnel Beaker culture from Polish Lowlands indicate regional differences in terms of quantities, raw material structure [...] or abundance of various typological forms; however, in a general view, they all represent a quite coherent model of behaviours associated with acquisition, processing, utilisation and disposition of both, local as well as “imported” flints. This generalised picture of the flint industry recorded at sites enclosed in this paper corresponds well with the flint processing model typical of the classical Wiórek phase of the Funnel Beaker culture in Kuyavia (described by L. Domańska 2013), the application of which can be extended over other regions of the FBC settlement in the zone of the Great River Valleys in Polish Lowlands” (Małecka-Kukawka 2020, 253).

DISCUSSION – SEARCHING FOR A DISTRIBUTION MODEL OF “EXOTIC” LITHIC RAW MATERIALS

Having analysed the data listed in Table 2, we can state that the general model explaining the frequencies of occurrence of mined raw materials has been confirmed: the further from the extraction areas and flint processing and workshop sites, the lower the contribution of artefacts made of “exotic” flints is recorded. As was presented in Table 2, the highest index, accounting for 33.8%, was obtained for the Gostynin Lake District. The lowest was recorded for the Starogard Lake District and Greater Poland (1.8 % and 0.6%, respectively). An exception in this respect is the region of Central Poland. Although it is located within the closest distance from the flint outcrops, when compared with all other agglomerations of the FBC eastern group, it revealed a significantly lower index of “exotic” lithic materials than any other, more remote regions (Fig. 2). Any attempts to explain this phenomenon exceed the scope of the present paper.

From the viewpoint of decades of studies upon Neolithic flintworking, it seems that the confirmation of the relevance of the model of flint processing and distribution as an operational chain under the scheme “mines – flint processing and workshop sites – end-users at settlements” for successive flint assemblages, is not able to extend our knowledge in this respect any further, neither is the well substantiated flint processing model of the classical Wiórek phase. Due to its repetitiveness in all of the regions of the FBC settlement in Polish Lowlands, it has lost its role as a creative, analytical tool. Nevertheless, noteworthy in this respect are the materials from the site 20 in Redecz Krukowy associated with the early FBC phases, mainly due to exceptionally numerous collections of flint artefacts made of chocolate flint, the number of which is multiple times greater than any other recognised assem-

Table 2. Frequencies of “imported” flint materials per particular region of the FBC eastern group during the younger stages (3650-3100 calBC)

region	jp	cz	św	wol	pas	N imp.	N total	% imp.
Gostynin Lake District	3,0	14,4	6,3	7,3	2,9	270	798	33,8
Kuyavia S-E	0,6	6,8	10,0	8,0	0,3	319	1242	25,7
Kuyavia N-W	0,6	9,5	0,9	2,1	0,4	755	5557	13,6
Dorzyn land	-	3,4	2,7	1,4	-	11	146	7,5
Central Poland	0,9	2,6	0,7	1,0	0,1	120	2217	5,4
Chelmino land	0,2	1,6	2,8	0,1	0,1	60	1276	4,7
Greater Poland	0,1	0,5	0,1	0,03	-	18	2791	0,6
Starogard Lake District	-	0,21	0,35	1,2	-	50	2823	1,77

Abbreviations of types of flints as in table 1; N imp. – number of „imported” flints; N total – total number of flints determined in terms of raw materials; % imp. – index of „imported” flints.

For the Starogard Lake District, data from the site Bielawki 6 were neglected (we do not know how many artefacts should be associated with the Funnel Beaker culture). If we took this data into account, the particular „imported” lithic raw materials indices would be significantly lower.

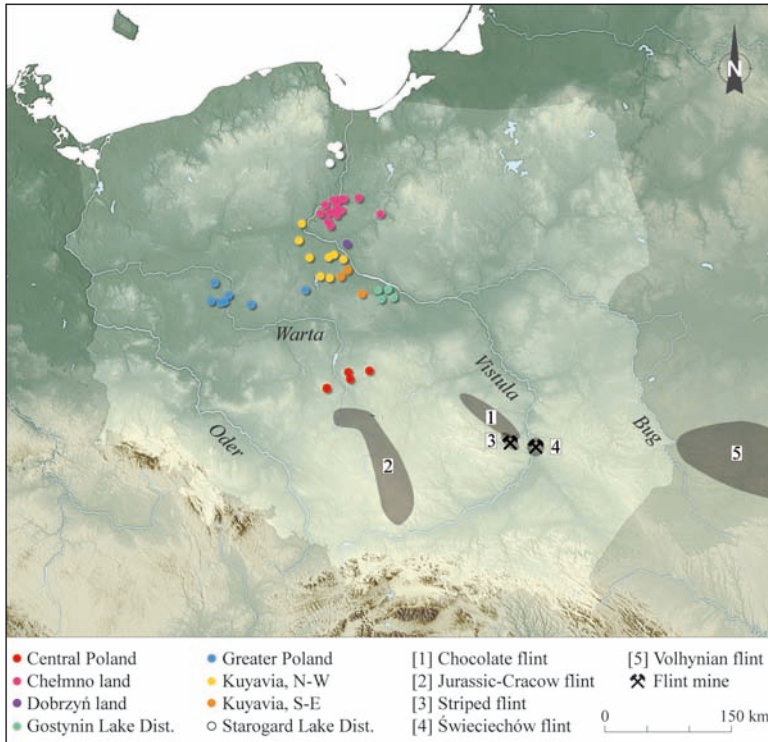


Fig. 2. Settlement agglomerations in particular regions of the FBC eastern group with location of selected flint outcrops and mines (map background: Yarr65/Shutterstock.com; compiled Ł. Kowalski)

blages made of this type of flint known from the FBC sites (Papiernik and Wicha 2018, 313-397). Technical and morphological analyses performed for this material have revealed that in this particular case, ready-to-use artefacts made of chocolate flint were brought to the settlement from the outside; therefore, they cannot be considered as the remains of a processing and workshop site. Whatever their provenance was, this exceptional collection on the scale of the entire FBC eastern group, in terms of its abundance, requires a different interpretation (Papiernik and Wicha 2018, 382, 383).

FUNCTIONAL ASPECTS OF ARTEFACTS MADE OF “EXOTIC” LITHIC MATERIALS – THE USE-WEAR APPROACH

Flint materials from the Starogard Lake District were subject to micro use-wear analysis. This analysis allows obtaining information about the functional application of various forms of artefacts, allowing us to identify similarities and differences between particular flint assemblages. Microscopic observations covered all of the artefacts that were also classified in terms of raw materials and subject to morphological analysis according to the methodological approach adopted for studies on the Neolithic flint material from the Chełmno land (Małecka-Kukawka 2001). Unfortunately, investigations of the function of flint artefacts are not so commonly applied to other regions occupied by the Neolithic communities. Indeed, in the recent dozen or so years, we can observe an increase in the number of micro use-wear elaborations contained within more and more publications.

Nevertheless, they hardly cover the entire assemblages; instead, they focus on only some part, consisting of arbitrarily selected specimens, usually morphological tools, and a subjective choice of more “spectacular” artefacts. Results of such analyses are mostly considered as annexes to the factual content of articles, having no more significant impact on interpretations based on “traditional” approaches (for relevant remarks, see Jankowska 2017, 344, 345). Due to this, it is difficult to perform comparative studies for materials from the regions occupied by the younger FBC communities discussed in this paper. However, we decided that comparing materials, for which micro use-wear analysis was performed based on identical methodological principles, coming from two settlement concentrations located along the Vistula River, may be interesting and can deliver some new data on artefacts made of “imported” lithic materials in the cultural contexts of their utilisation.

For the needs of the issues considered in this paper, we compared the analysis results in the most generalised manner, summing the number of artefacts bearing traces of utilisation within two categories: functional tools made of local and “imported” lithic materials. The results of this analysis are presented in Table 3. For the older FBC phase in the Chełmno land, the contribution of artefacts bearing traces of utilisation made of local lithic materials (considered 100%) amounts to 16.3%. In comparison, the proportion of those made of “imported” flints accounts for 64.8%. For the younger FBC phases, regarding the

Table 3. Frequencies of flint artefacts with use-wear traces in the local and “imported” raw material

Regions and chronology of FBC	Local flints		Imported flints	
	N	T	N	T
Chelmno land Older FBC	619	101 (16,3%)	108	70 (64,8%)
Chelmno land Younger FBC	420	39 (9,3%)	26	18 (69,2%)
Starogard Lake District Younger FBC	1403	81 (5,8%)	49	41 (83,7%)

N – a number of artefacts subject to use-wear analysis; T – a number of flint artefacts with use-wear traces and their percentage within the given category

Chelmno land and the Starogard Lake District, the percentage of functional tools made of local lithic materials is significantly lower (9.3% and 5.8%, respectively). The contribution of functional tools made of “imported” flints from the Chelmno land is higher and amounts to 69.2%, while for the Starogard Lake District, their proportion reaches up to 83.7%. Having analysed the numbers given in Table 3, one can conclude that the increase in the number of artefacts made of local lithic materials is correlated with the decrease in the percentage of functional specimens with traces of utilisation. This is associated with the differences in activities performed during the flint processing, revealed through analysing the morphological structure of assemblages, mainly focused on categories of flakes and core reduction waste products (*cf.* Małecka-Kukawka 2001, 55–83; 2020). Flint inventories from sites in Eastern Pomerania are much more abundant than those from the Chelmno land. This is most likely due to the local accessibility of lithic materials and their quality. Still, it may also result from the local rules of raw material acquisition, namely bringing to the settlement many poor-quality materials and discarding most of them as useless waste within the settlement boundary. This regional variability in the number of assemblages made of local lithic materials might have been affected by the manner of inventorying flint materials during excavations (for more details, see Małecka-Kukawka 2020, 228). Moreover, we should stress a legible difference in the number of artefacts bearing traces of utilisation made of “imported” lithic materials. For the assemblages from the Starogard Lake District, this index is nearly 15% higher when compared with the collections from the Chelmno land (83.7% vs 69.2%, respectively).

A great abundance of flint assemblages from the Starogard Lake District, resulting from local accessibility of raw materials, might have affected the results of investigations on the contribution of “imported” flints (Table 2) and the index of artefacts bearing traces of utilisation. To minimise the risk of distortion of the functional picture of the collections under study, due to the local conditions in terms of lithic material accessibility and the manners of discarding waste products, we decided to present the contribution of artefacts

Table 4. Flint artefacts with use-wear traces (100%) are given in basic categories of raw materials

Regions and chronology of FBC	Local flints	Imported flint
Chelmno land Older FBC	59%	41%
Chelmno land Younger FBC	68%	32%
Starogard Lake District Younger FBC	66%	34%

bearing traces of utilisation, considered as 100%, divided into two major categories – local and “exotic” flints (see Tab. 4). These results turned out to be most surprising. Having analysed the numbers given in Table 2, one can conclude that the proportion of “imported” flints in the Chelmno land (taking into account all of the collections under study) is nearly thrice as high as their proportion in the Starogard Lake District (in a ratio of 2.6 to 1). From the viewpoint of micro use-wear analysis, a conclusion may be drawn that the younger FBC phase frequencies of local and “imported” flints bearing traces of utilisation are almost identical (Tab. 4). Since the data presented in this paper comes from merely two regions of the FBC settlement areas, we refrain from stating decisively whether all that was said above was just a coincidence or rather an observation of a crucial interpretative significance. At this point, we would tend to opt for the latter option. Despite some essential differences in frequencies of “imported” raw materials between the assemblages from the Chelmno land and the Starogard Lake District, their functional utilisation was nearly identical. It should also be stressed that from the perspective of micro use-wear analysis, in both of these regions, two-thirds of all tools with traces of utilisation were made of local lithic materials. In contrast, only one third was made of “exotic” flints.

THE PHENOMENON OF DISTRIBUTION OF “EXOTIC” LITHIC RAW MATERIALS – ANTHROPOLOGICAL APPROACH

In the line of our findings from 2019, complemented with the new data from the Starogard Lake District, we can conclude that each of the regions of the FBC settlement has its own cultural (anthropological) expression (Adamczak, Kukawka and Małecka-Kukawka, 2019, 182, 183). We agree with Andrzej Piotr Kowalski, who claims that “(...) the phenomenon of culture does not consist of sets of objects exclusively; instead, it is determined by a certain composition of values constituting the status of these objects in the context of a particular society” (Kowalski 2014, 34).

Revealed in archaeological investigations, differences in the contribution of artefacts made of “exotic” materials have strengthened our hypothesis of territorial communities

Table 5. Frequencies of „imported” raw materials in the total number of flint artefacts per particular region of the FBC settlement (the given order of areas is consistent with the distance from the outcrops of flints in southern Poland)

regions	jp	cz	św	wol	pas	N imp. (100%)	% imp
Central Poland	18	48	13	20	1	120	5,4
Gostynin Lake District	9	43	19	21	9	270	33,8
Kuyavia S-E	2	27	39	31	1	319	25,7
Kuyavia N-W	4	70	7	16	3	755	13,6
Chełmno land	3	33	60	2	1	60	4,7
Starogard Lake District	0	12	20	68	0	50	1,8
Greater Poland	11	72	11	6	0	18	0,6
Dobrzyń land	0	45	36	18	0	11	7,5

Abbreviations of types of flints as in table 1. N imp. – number of „imported” flints; % imp – index of imported flints in entire collection. The internal frame stands for the regions with at least 50 “imported” flints evidenced. The other two regions showing a single flint artefact share at 6% and 9%, respectively, were excluded from further considerations. The numbers in bold are marked to draw the reader’s special attention.

with different beliefs and cultural behaviours, including manners of acquisition and utilisation of artefacts made of lithic materials.

To display these regional differences, we compared data referring to the intensity of “imported” flints, where the proportion of particular types of flints was confronted with the total number of “imported” flint materials, considered 100% (Tab. 5). This comparison should be taken as one of the possible results since we are aware that any new data may verify these determinations. This mainly concerns the regions of Greater Poland and the Dobrzyń land, where, at this point, a single artefact constitutes 6% and 9%, respectively. The state of current knowledge impact on the distribution of raw materials (and others) has been evidenced distinctly in our elaboration of materials from the Starogard Lake District.

In Table 5, we have listed the percentage of particular “imported” materials within the overall number of artefacts (the sum of all specimens made of “exotic” flints, considered as 100%) per particular region. The last column (excluding the data from Central Poland, which was explained in the introduction) confirms the above-described model, namely, the further from the flint outcrops, the smaller number of “exotic” materials within the structure of flint assemblages. We also stressed the role of micro use-wear analysis and its possibilities in verifying this model, providing that only the artefacts bearing traces of utilisation were taken into account. In Table 5, we have marked in bold the percentages of particular extra local lithic materials in three regions: northern Kuyavia, the Chełmno land and the Starogard Lake District. The indices of particular “exotic” flints vary in these regions: for northern Kuyavia, the highest is the contribution of chocolate flint (70%), for the Chełmno land – Świeciechów flint (60%), and for the Starogard Lake District – Vollhynian flint (68%).

While making an attempt to understand the phenomenon of distribution of raw materials, we cannot neglect the importance of the location of distinguished territorial communities (obviously, keeping in mind that the proposed division is only stipulated, constructed for the needs of this paper, and based on the current state of knowledge), which is strictly associated with the distance from the outcrops of “exotic” flints, their potential, direct or indirect, accessibility, and finally relations of certain human groups with their neighbours. These relationships, clearly legible thanks to the results of analyses of pottery and flint assemblages (made of “exotic” materials, in particular), shaped the regional and interregional connections that formed specific communities, changeable throughout time and space, of various degrees of cultural affinity.

Apart from other factors discussed in the introductory part of this paper, complex systems of distribution could have affected the recorded variability in the structure of flint assemblages coming from particular sites. In this respect, one should consider the duration of the FBC eastern group development. During this period, lasting for several hundreds of years, the individual (social) relationships with the neighbours or more remote groups of people could have got closer or, on the contrary, might have diminished in time. This must have affected the scale of the inflow of foreign artefacts, potentially desirable, though unequally accessible, depending on time and space. We can also point out another reason for the individualism mentioned above. Directions of the inflow of “exotic” materials were undoubtedly more complex than the suggested “routes” running along both banks of the Vistula River. In this case, we refer to interregional migration mentioned in the literature (*e.g.* to the Chełmno land). This movement could have disturbed these interregional relationships and consequently affected short-term, at least, changes in human associations, resulting in an “atypical” inflow of “exotic” flints (brought by immigrants themselves or obtained as an effect of their connections with their motherlands).

A constant interest in “exotic” flints and their continuous inflow to the FBC communities in Polish Lowlands evidence a permanent relationship with settlements located in the south-east and in the south. The basis of these relationships should be sought in the gift-giving obligation with the system of goods exchange, distinctive for the early farming communities (including those of the Funnel Beaker culture), which characterises most aptly the very essence of distribution of artefacts made of “exotic” lithic materials (*cf.* Mauss, 1973; Burszta 2005, 18-24; Kowalski 2005, 25-33; Lech 1981; Małecka-Kukawka 2001).

These interconnections were not disturbed either during the Baden era in the region (Badenisation process of the FBC) or through the contacts with the Subneolithic hunter-gatherer-fishers (Subneolithisation process of the FBC) that are clearly evidenced by the ceramic assemblages and further supported by the data in Table 5. Investigations of flint assemblages open different cultural views on the Neolithic societies whilst challenging the supremacy of ceramic evidence in archaeological research. After all, both these categories of artefacts were left in the same place by the same group of people.

CONCLUSIONS

1. In general, in the younger phases of the FBC eastern group development, the most commonly encountered imported raw materials were chocolate, and less frequently, Świeciechów flints. Striped and Cracow Jurassic flints played a marginal role in this cultural context.

2. The index of contribution of imported raw materials, computed in relation to the entire flint collection, indicates that the further from their outcrops, the smaller their proportion was. Exceptional in this respect is the region of Central Poland, situated within the closest distance from the outcrops of Jurassic, chocolate, Świeciechów and striped flints. This may be due to the location of this region outside of the main distribution routes. It is also possible that the traces of settlement in this region come from a short period of expansion of the FBC eastern group to the south, when the intensity of inflow of imported goods within this cultural unit decreased. Other potential interpretations of this phenomenon cannot be excluded either (see point 6).

3. Currently distinguished regions significantly differ one from another in terms of frequencies of particular foreign raw materials. This indicates an actual regionalisation of local FBC communities and diversified valorisation of raw materials within these units.

4. Technical and utilitarian qualities of “exotic” raw materials were exploited and highly appreciated. However, these qualities might not have been the major reason for acquisition of those flints. This hypothesis is supported by the following observations: lack of foreign raw materials in some post-settlement structures, predominance of utilised tools made of local flints, and a fact that *ca.* 20-30% of all specimens made of imported materials bear no traces of utilisation.

5. Acquisition of “exotic” lithic raw materials was an effect of more complex connections and relationships between particular human groups, exceeding beyond the utilitarian aspect. This conclusion is consistent with the contemporary opinions on the Neolithic culture in general. Valorisation of these raw materials’ foreign (exotic) nature might have not been associated with their utilitarian value at all, *i.e.* raw material management needs.

6. Surprising results were obtained thanks to comparing the functional structure of flints coming from two regions, namely the Starogard Lake District and the Chełmno land. In both of these regions *ca.* 70% of tools bearing traces of utilisation were made of local raw materials, while only 30% represented imported flints. Nevertheless, within the group of artefacts made of local flints, considered 100%, functional tools constituted only 6-9%, while amongst the specimens representing the “exotic” raw materials (again, considered 100%) functional tools enclosed as much as 70-80% of all artefacts. Noteworthy is a significant overrepresentation of “exotic” flints (with traces of utilisation) in reference to their contribution within the entire flint collections (discussed in point 2). This prompts us to a deeper reflection upon the manner of evaluation of the scale of inflow of imported flints

based on the analysis of assemblages coming from post-settlement waste deposits. Due to the lack of more reliable data obtained from micro use-wear analysis performed for all flint artefacts coming from a particular site (usually it covers only selected specimens), we are not able to compare our findings with other regions of the FBC settlement.

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