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Being at Home in the Early Chalcolithic. The Longhouse Phenomenon in the Brześć Kujawski Culture in the Polish Lowlands

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Abstract: The Brześć Kujawski culture emerged in the Polish Lowlands in the second half of the 5th millennium BC. It shares many characteristic features with Chalcolithic cultures of the Carpathian Basin indicating that BKK communities belonged to the wider ‘late Lengyel interaction sphere’. However, there are very striking regional distinctions in the material culture of these communities, which appear to reflect a conscious attempt to emphasize local identity, incorporating both innovation and conservatism. This article focuses on one of the most distinctive features of this culture – trapezoidal longhouses, presented here in the context of astonishingly various and hierarchical settlement system of the BKK. In this respect the iconic character of houses expressed by the uniformity of their form and size, seems to be a deliberate decision that stressed local identity in reference to the LBK heritage as well as other contemporary communities inhabiting the Polish Lowlands in the 5th millennium BC.

Keywords: Polish Lowlands, Neolithic, Chalcolithic, Brześć Kujawski culture

1 Introduction

In the second half of the 5th millennium BC (4350–3900 cal BC; Czerniak et al. in press) the Brześć Kujawski culture (further: BKK) emerged in the Polish Lowlands. It belonged to the broadly defined circle of Late Lengyel influences, where it constituted the outermost NE zone. Its characteristic features are very distinctive and quite easily recognisable within boundaries marked on the presented map (Figure 1). Merely the affiliation of the Lower Oder region remains uncertain, because of the insufficient state of field research.

One of the most important features that stressed the regional identity of the BKK communities was the very distinctive longhouses of a very specific form and construction. In our opinion special attention in the interpretation of this phenomenon must be paid to social changes that took place in the 1st half of the 5th millennium BC, so in the time between the Linear Band Pottery Culture (further LBK) and the BKK on the one hand, and on the other to a social context contemporary with these houses, in the second half of the 5th millennium. These are the two main issues of our paper. Some topics will be discussed at length: the size of settlements, their layout, the size of houses, the rules of their succession but because of the lack of sufficient data we will not go into every detail on the question of the number of inhabitants or the exact time houses and settlement were used.
The interpretations presented below refer to all known BKK sites; however, a more detailed analysis is confined to a small but quite well studied region around Brześć Kujawski (Figure 2).

Fig. 1. Map of the BKK. Marked are the most important Brześć Kujawski type sites.

Fig. 2. Sites of the BKK in the Brześć Kujawski region. Sites mentioned in the text: 1- Bodzio 1, 2- Dubielew 8, 3- Konary 1, 4- Oslonki 1, 5- Konary 1, 6- Miechowice 4a, 7- Miechowice 4, 8- Brześć Kuj. 4, 9- Brześć Kuj. 3, 10- Pikutkowo 6a, 11- Kruszynek 6, 12- Ludwinowo 3, 13- Ludwinowo 2.
2 Between the LBK and the BKK

Serious social changes that took place in the first half of the 5th millennium, after the demise of the LBK and before the emergence of the BKK (Figure 3) can be well illustrated by typical forms of settlements and houses of this time. Relatively numerous sites of the so called Late Band Pottery Culture (further LBPC) demonstrate that unlike the stable, multi-generational villages of longhouses typical for the LBK, only small and short-lived hamlets existed at that time. Their remains, quite frequently discovered within the last decades, consist of singular graves and clusters of a few pits, probably connected previously with a kind of unstable, light dwelling construction.

The only exception is made by singular post framed houses known hitherto solely from two sites: Konary 20 in Kuyavia and Białcz Stary 4 in Greater Poland. These houses express the much more general trend originated in the post-LBK cultures of the Carpathian Basin consisting in dislocation of borrowing pits previously set along a house’s walls and the construction of roof structure based only on a single row of internal posts (Pavůk 2012). Their slight trapezoidal shape and specific construction refer especially to the Stroke Band Pottery culture (further SBK) houses from Bohemia (especially in Jaroměř – Burgert et al. 2014: Fig. 1, see Fig. 7B), a reference which is strengthened additionally by similarities in pottery forms and stylistics of the LBPC. The above-mentioned houses from the Lowlands, however, are considerably smaller than the LBK average. In the case of all other settlements, houses must have had an even lighter and less stable construction.

The lack of vast villages and a long lasting and complex settlement layout indicate that the decline of the LBK in the Lowlands was connected with a much more serious crisis and changes in the ways of life than in the Danube area, where we also record serious social transformations but where large or even very large villages and cemeteries of the Lengyel culture took the place of extensive settlements of the LBK. In contrast, in the Lowlands it is not only a time of the decline of stable villages but also of a strong dispersion of settlement, comparable to the later phases of the SBK in Bohemia, Lower Silesia and Saxony.

Furthermore the LBPC expanded far outside the enclaves previously occupied by the LBK into an environmental of unusually sandy areas of Pomerania, Warmia and Masuria.

![Fig. 3. 5th millennium in the Polish Lowlands. Schematic chronological chart of archaeological cultures.](image)

The drastic character of these changes has sometimes been interpreted as the result of leaving the Lowlands by the LBK people, a following hiatus and then subsequent re-colonisation by new migrants coming from the SBK in the Oder and Elbe-regions (Grygiel 2004). Archaeological evidence points undeniably to a serious crisis connected with the demise of the LBK, which resulted in the disintegration.
of community groups constituting households and villages typical for the LBK. Its consequence, however, must not necessarily have been depopulation and re-colonisation, because the indications of hiatus in the typochronology of pottery are quite weak and we are convinced that this hypothesis will be rejected after analysis of a greater series of C14 data.

In our opinion the decline of the LBK in the Lowlands caused serious transformations of the whole settlement system, and as a result small, independent, mobile and scattered family groups of the LBPC emerged, who dwelt in much less solid but easy to construct houses.

The decline of the previous community system also probably resulted in the destruction of the 600-year-old (5400–4800 cal BC) communication network on the local as well as interregional scale, which had controlled not only the exchange of raw materials and products but also the transfer of certain social patterns and styles of material culture. All these factors provide the context for the changes described in building forms and everyday items. The more general question as to what caused this crisis at the dawn of the LBK still remains unanswered but it is another topic not to be addressed here.

Against this backdrop the emergence of numerous and solid villages of the BKK around 4350 cal BC (according to dating: Czerniak et al. in press) can be regarded as a new social and economic turn reflected by the evolution of new, more complex social and settlement structures. In the case of the BKK it can be interpreted as a reference to the old LBK heritage as well as an adoption of new Chalcolithic ideas.

### 3 Brześć Kujawski Type Settlements

The well known settlement at Brześć Kujawski site 4 is an excellent example of a new model of village organisation in the second half of the 5th millennium BC in the Polish Lowland. It is distinguished by a long-lasting (ca 300–400 years) relatively compact and vast (from 3 to 6 ha) layout consisting of longhouses with associated pits of various functions as well as settlement burials (Czerniak 2002; Grygiel 2008).

More detailed analysis of known BKK settlements indicates, however, their differentiation concerning the number of houses, their density and layout, which depended on specific rules regulating the problem of the abandonment and the construction of subsequent dwellings. One of the substantial features diversifying BKK settlements was also the number and richness of burials. Our interpretation of above-mentioned elements will be exemplified by a thorough analysis of sites located in the vicinity of well-known settlements at Brześć Kujawski and Osłonki, where many other similar sites have been excavated in the last decades (Figures 2-4, Table 1): some published by R. Grygiel (2008), but also new ones, mainly still unpublished, discovered due to emergency excavations on the A1 motorway: Dubielewo 8 (Mikulski and Siewiaryn 2011), Bodzia 1 (Czerniak 2012b) and Ludwinowo 2 (Sobkowiak-Tabaka and Kabaciński 2012), Ludwinowo 3 (Malcherak 2011, Marchelak et al. 2012) and Kruszynek 6 (Siewiaryn 2010). All these data indicate the existence of a complex, hierarchical settlement network of a quite large demographic potential.

#### Table 1. Characterisation of BKK settlements from the Brześć Kujawski region. Numbers of sites according to Figure 2.

<table>
<thead>
<tr>
<th>No.</th>
<th>site</th>
<th>number of houses</th>
<th>number of graves</th>
<th>excavated area in 100m²</th>
<th>graves per house per 100m²</th>
<th>houses per 100m²</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Bodzia 1</td>
<td>9</td>
<td>3</td>
<td>188,46</td>
<td>0,333</td>
<td>0,048</td>
</tr>
<tr>
<td>2.</td>
<td>Dubielewo 8</td>
<td>15</td>
<td>12</td>
<td>66,99</td>
<td>0,800</td>
<td>0,224</td>
</tr>
<tr>
<td>3.</td>
<td>Konary 1</td>
<td>7</td>
<td>4</td>
<td>18,65</td>
<td>0,571</td>
<td>0,375</td>
</tr>
<tr>
<td>4.</td>
<td>Osłonki 1</td>
<td>31</td>
<td>96</td>
<td>135</td>
<td>3,097</td>
<td>0,230</td>
</tr>
<tr>
<td>5.</td>
<td>Konary 1a</td>
<td>4</td>
<td>7</td>
<td>7,24</td>
<td>1,750</td>
<td>0,552</td>
</tr>
<tr>
<td>6.</td>
<td>Miechowice 4a</td>
<td>14</td>
<td>6</td>
<td>34,5</td>
<td>0,429</td>
<td>0,406</td>
</tr>
<tr>
<td>7.</td>
<td>Miechowice 4</td>
<td>11</td>
<td>7</td>
<td>36,7</td>
<td>0,636</td>
<td>0,300</td>
</tr>
<tr>
<td>8.</td>
<td>Brześć Kujawski 4</td>
<td>&gt;50</td>
<td>85</td>
<td>140,7</td>
<td>1,700</td>
<td>0,355</td>
</tr>
<tr>
<td>9.</td>
<td>Brześć Kujawski 3</td>
<td>2</td>
<td>6</td>
<td>17,35</td>
<td>3,000</td>
<td>0,115</td>
</tr>
<tr>
<td>10.</td>
<td>Pikutkowo 6a</td>
<td>5</td>
<td>4</td>
<td>35,6</td>
<td>0,800</td>
<td>0,140</td>
</tr>
<tr>
<td>11.</td>
<td>Kruszynek 6</td>
<td>12</td>
<td>9</td>
<td>184,61</td>
<td>0,750</td>
<td>0,065</td>
</tr>
<tr>
<td>12.</td>
<td>Ludwinowo 3</td>
<td>7</td>
<td>7</td>
<td>567,33</td>
<td>1,000</td>
<td>0,012</td>
</tr>
<tr>
<td>13.</td>
<td>Ludwinowo 2</td>
<td>1</td>
<td>0</td>
<td>42</td>
<td>0,000</td>
<td>0,024</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>168</td>
<td>150</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Fig. 4. Houses and graves on BKK settlements at Kruszynek 6, Ludwinowo 3, Pikutkowo 6a and Bodzia 1. According to: Siewiaryn 2010; Marchelak et al. 2012; Grygiel 2008; Czerniak 2012b, modified by the authors.

Fig. 5. Houses and graves on BKK settlements at Dubielewo 8, Miechowice 4, Oslonki 1, Konary 1, Miechowice 4a and Brześć Kujawski 4. According to: Mikulski and Siewiaryn 2011; Grygiel 2008, modified by the authors.
3.1 Number of Houses

Concerning the different settlement layout the number of houses seems to be a better indicator of a site’s size than its area itself. Table 1 lists the number of excavated houses, including suggested or reconstructed ones on the basis of some partial indications such as the existence of characteristic internal cellar pits. Thus these numbers do not represent the complete numbers of buildings. In many cases, however (as can be demonstrated by the comparison of the data from Table 1 and the figures included), the estimated numbers might be regarded as close to reality. It should be so for Brześć Kujawski site 4 (more than 50 houses), Oślonki 1 (more than 31), Bodzia 1 (probably not many more than 9), Kruszynek 6 (not many more than 12), Ludwinowo 3 (ca. 7) and Dubielewo 8 (probably not many more than 15).

Certainly we are aware of the fact that the estimated house numbers can be a serious indicator of a settlement’s size only if we also consider their use time and the use time of a whole site. Unfortunately, there have not been sufficient studies concerning these issues so far, which would distinguish detailed occupational phases of single settlements. We will try to address it further only for the site at Brześć Kujawski 4. However, according to the chronological analysis of pottery we can roughly estimate that the analysed sites were occupied relatively simultaneously and for a similarly long time. Therefore, the calculated numbers of houses can be indeed treated as a significant indicator of a site’s size. We will raise this subject again in the further course of this paper.

Considering the number of houses for the analysed settlements in the Brześć Kujawski region, we can distinguish at least two types of sites: first – villages (or central sites), only in the case of Brześć Kujawski 4 and Oślonki 1; second – hamlets (or satellite sites when any dependency network existed), which refer to all other sites listed in Table 1, with 2-3 contemporaneous houses per settlement phase.

3.2 Density of Houses

We defined the house density ratio by estimating house numbers per 100 m² settlement area (Table 1; Figures 4-5). This ratio can well demonstrate essential variabilities in settlement organisation, concerning their general layout as well as rules of house successions, which will be described more thoroughly in the following section.

Regarding only the house density ratio we can divide the analysed sites into three groups: first – of a very loose density (ratio up to 0.1), second – of a middle density (0.2-0.3) and third – of a very dense built layout (0.4 and more). The first group (Figure 4) includes the smallest sites such as Bodzia 1, Ludwinowo 3, Kruszynek 6, although the correlation of house density with a site’s size seems not really significant.

It is already clearly visible when we compare the two greatest villages at Brześć Kujawski 4 (ratio 0.36) and Oślonki 1 (ratio 0.23; Figure 5), and much better if we confront a small settlement at Miechowice 4A (0.41) with the largest at Brześć (0.36) even if we consider that the first site has not been excavated on a comparably large scale. The key to the interpretation of this phenomenon might thus be the settlement layout.

3.3 Settlement Layout System

We will start our analysis with the most complex case of an extremely intensively occupied site at Brześć Kujawski 4. Its especially dense dwelling arrangement is very advantageous because of numerous stratigraphic relationships additionally confirmed by an analysis of pottery and house forms, which enables the assignment of many houses to single occupational phases.

The division into three phases of construction which is presented in Figure 6 draws on on the division used by R. Grygiel (2008) (including his criteria). However, in a few cases we modified the dating on the basis of a new stratigraphic analysis of a particular sequence of houses, or sometimes on the basis of the form of a dwelling. Moreover, as a result of this analysis we identified several additional houses which were ignored in earlier publications.
Fig. 6. Brześć Kujawski 4. Settlement plan divided into three main phases. According to Grygiel 2008, modified by the authors.

Evaluating the picture of how buildings developed at Brześć Kujawski as presented in Figure 6, it must be remembered that stratigraphic analysis indicates at least five and not three occupational phases. However, there are no grounds for classifying particular dwellings so precisely, especially as individual stratigraphic sequences, occurring separately, display a three- or sometimes two-phase layout. It is for this reason that not all of the dwellings that can be seen on the plan were classified as belonging to one of the three phases. It seems that the most broadly defined group in terms of chronology is phase II, which is why we have not
displayed all of the dwellings included in this phase by R. Grygiel (marked by a brown crosshatch) in our figure. The fact that in the majority of the sequences of houses a 2-3 phase sequence was noted should, we believe, be interpreted as revealing a shorter period of functioning of the individual clusters of houses compared to that of the whole settlement (e.g. as a result of the rebuilding of some abandoned houses outside the cluster in question).

R. Grygiel (2008: 310ff.), analysing the dwelling arrangement of Brześć Kujawski, put forward a hypothesis that houses had been built in rows. Notwithstanding such a sweeping generalisation, we can agree with this interpretation. By slightly modifying the initial hypothesis, we believe that it is possible to plot four lines of buildings forming a radiating pattern of dwellings converging at the eastern edge of the settlement near house 12/12A, which may have had a unique status since it was the longest house from the outset, was rebuilt on the same plan in phase II and stood out all the more thanks to the presence of a large, rectangular enclosure (Figure 6, the settlement in phase I).

The same building arrangement was repeated in the next phase, with house 12A being rebuilt in exactly the same place but extended in the north-south direction. It is likely that the same enclosure was still in use near the house. In the third phase, too, the overall building arrangement was preserved, with the difference that the site of house 12-12A, where previously the building lines had converged, was empty then, while the cluster of three houses 2-4-6 was located in such a way that the southernmost building line was slightly disturbed.

Summing up, we can state that the settlement had the same system of a dense housing arrangement (with a lack, unique for the BKK of large clay extraction pits within this settlement) from the beginning of its existence to the end, except that in the oldest phase the dwellings were located in the SE part, thus nearer the lake shore, while in the subsequent phases they increased their range in the NW direction. The second important observation is that there was a tendency for the average size and solidity of houses to increase over time.

R. Grygiel (2008: 310) suggests that a similar house row arrangement to that at Brześć Kujawski can also be seen at Osłonki, yet it is hard to agree with this. In our opinion, at Osłonki what we see is a rather poorly ordered arrangement of houses around an inner building-free space. The situation at Osłonki differs moreover in the system of succession of houses and the presence of large complexes of clay pits between the houses, and ultimately in the much lower ratio of building density.

The row arrangement of houses, very similar to that at Brześć Kujawski can be seen at Dubielewo 8 (Figure 5) and – outside the area considered here – at Zelgno 1 (cf. Czerniak 2002). In both cases it was, however, a single row arrangement with a few examples of the plans of houses overlapping in the central part.

Irrespective of the above interpretation, we believe that the basic (and overriding) principle for the organisation of buildings at all of the BKK sites, though in the cases described above it works in parallel, was the clustering of houses. Such clusters consisting of two to five (seldom more) contemporary and/or successive houses could reflect a quite stable division of a village’s space between separate household communities. It is a system visible already in the LBK (yard model – modified – Czerniak 2016), where it occurred beside the row model (Rück 2007), but also quite common in the SBK (e.g. Burgert et al. 2014). In the case of Brześć Kujawski it is visible that in the first phase the dominant form of the organisation of buildings was pairs of houses. However, in subsequent phases, perhaps because of the increase in the average size of houses, next to the pairs of houses there appeared single houses and in the third phase there was even a ternary arrangement of dwellings (2-4-6).

The question as to what temporal relations there were between the houses in a binary arrangement (pairs of houses) and those in a ternary arrangement has long aroused much controversy concerning both LBK and post-LBK settlements (Pleinerová 1984). Today it seems that there was no single solution. The discovery of pairs of houses connected by fences in the LBK (Czerniak 2013), SBK and the Lengyel culture (Burgert et al. 2014: 46) is proof that pairs of houses functioned synchronously as a complex household. At the same time, there are a number of observations within the BKK (for example at Racot – Czerniak et al. in press) indicating that house pairs could be the result of a building succession. Houses 56/56a at Brześć Kujawski are a good example of this successive pattern, because due to their location on the outskirts of the village they can be quite precisely dated (Grygiel 1984, Grygiel 2008).
3.4 System of House Succession

The problem of house successions within clusters seems to be especially relevant for further considerations because on the analysed sites two systems can be distinguished. In the first one a new house was constructed more or less precisely on the spot of the previous building. There was an array of possible options: building a new house exactly on the old plan, following the same main axis but enlarging the new construction, and finally only partial superposition of plans (in two versions: with the same or changed orientation). The second type of succession involves the building of a new house next to the old one; yet here, too, there are several variants, from typical house pairs, which can be recognised by their similar dimensions and mutually parallel position (in a version with a wider gable built along the same line or in a ‘z’ shape), to layouts in which each house has a slightly different orientation. It should be added that the second system of house succession, in the first version, without independent dating of houses, is impossible to differentiate merely on the basis of the shape and location from the system of house pairs functioning synchronously (which could also mean that one of the houses was built slightly later, with the older one nevertheless still functioning). This is a serious limitation to the possible interpretations of the buildings. Below, we will attempt to illustrate the above perceptions in the form of a detailed analysis of examples of buildings in the Brześć Kujawski region.

In the case of settlements with the lowest housing density (about 0.1), the plans of which are shown in Figure 4, it is possible to talk of buildings in the form of spatially isolated single houses or clusters composed of 2 to 4 houses. Meanwhile, the most common situation seems to be pairs of houses. The plans of these settlements resemble somewhat the housing of Brześć Kujawski 4 in one of the settlement phases (cf. Figure 6). This is why it must be clearly stated that in none of these cases (Figure 4) is it possible to speak of one settlement phase. It could even be suggested that the time span between the oldest and the youngest houses was akin to the duration of the functioning of Brześć Kujawski.

Miechowice 4

A more complex situation can be seen in settlements with a greater housing density. For example, at Miechowice 4 (Figure 5), standalone, single houses can be seen, which became the genesis of the clusters of houses that emerged as a result of dwellings being abandoned and rebuilt in more or less the same place. Thus clusters of houses are in this case the result of the succession system of building. Among the four clusters which can be distinguished here (omitting houses discovered near the edge of the excavation, for which we do not know the context), in two we can see that reconstruction took place three times, and in the other two, twice. Meanwhile, if the dating of these houses is correct, then we can talk of the tendency to increase the dimensions of buildings built subsequently, which might also suggest the reasons for abandoning the old dwelling and building a new one.

Miechowice 4A

A similar arrangement of buildings can be seen at neighbouring Miechowice 4A, where in some cases it is possible to distinguish as many as four phases of building a house in the same place. Examples of this are houses 6-7-8-6A (here we identified an additional house – 6A), which form an arrangement that indicates that the same house was rebuilt four times in the same place, yet always with the same dimensions. By contrast, it is difficult to state whether the house next door, house 9, is an example of succession by building a house alongside (we would then have five phases of building), or rather of synchronous functioning of two houses in one of the phases. Taking into account the system of succession predominant in this cluster, the synchronous functioning of house 9 and house 7 seems more probable.

Other examples are houses 5-10-11, which indicate that the same house was rebuilt three times, though house 5 could have been created as an extension of the still functioning house 10. Similarly, house 2 was probably built by significantly extending house 3. To sum up, if we generalise from these observations, we can say that the abandoned houses at this site were rebuilt in approximately the same place and predominantly with the same dimensions and orientation.
Osłonki 1

The building arrangement was different at Osłonki 1, which was a central site for both of the settlements presented above. It was the only village in Kuyavia partially enclosed by a ditch, with houses arranged around an inner empty space. What seems characteristic for this settlement is the arrangement in the form of pairs of houses, which could be an expression of another system of succession (e.g. houses 25-26; 14-16) or of – at least partially – the synchronous functioning of pairs of houses (e.g. houses 9-10; 15-18; 28-29). Single houses can also be seen here, rebuilt in the same place but no more than twice (e.g. houses 22-23; 23; 9-12; 32-33).

The most complex is the arrangement of four houses 5-6-7-8 at Osłonki, forming a pair of connected houses of which each was rebuilt once in the same place (7 in the place of 8 and 5 in the place of 6). However, bearing in mind the close proximity of the houses, the synchronous functioning of the pairs of houses in two phases should be excluded. More likely is the three-phase arrangement, under which house 8 first functioned, then the house pair 6-7 with identical dimensions to those of house 8, and in the last – third – phase, one very large house, house 5. Thus this house could have been a succession house not just for house 6 (as suggested by Grygiel 2008: Fig. 404), but for the house pair 6 and 7. This cluster of houses was the only one at this settlement with a three-phase arrangement of houses.

Brześć Kujawski 4

Brześć Kujawski 4 is decidedly different from all settlements of eastern Kuyavia in terms of the high density of the dwellings and the complexity of the succession system of houses. Probably for this reason, the borders of the clusters of houses are less clear. They are also more varied. Both multiple extensions and conversions of the same house are visible as well as complex binary and ternary arrangements of parallel houses. The examples below will serve to illustrate this in more detail.

Houses 46-47-48. House 47 could have formed a pair with house 48 and functioned synchronously with it. In the next phase, only house 46 functioned, having been built on the plan of house 47 with only minimal changes to the dimensions.

Houses 32-16-17-14 (all of similar dimensions) form a three- or four-phase cluster, but if we were to consider that houses 16 and 17 could have been rebuilt (house 16 being the result of a slightly elongated extension), then it could even be five phases. According to R. Grygiel (2008) houses 32 and 14 were the oldest in this group, but their slightly different orientation might indicate that they were not constructed simultaneously as a house pair but independently or successively (for example first house 14 and later house 32). It is interesting that in the last two phases, houses 16 and 17, which overlap with the outline of house 14, draw on the neighbouring house 32 in terms of their orientation. Thus it may be that there was a relationship of succession only between houses 32-16-17, while both the younger houses (17-16) were located as if to form a pair with the oldest house (32).

Houses 21 and 23 are examples of a two- or three-phase reconstruction of a house of the same size (if we were to distinguish here one more house not included in Grygiel’s publication (2008)), but first with a substantial shift with regard to the outline of the foundations of the oldest house and then almost exactly in the same place.

Houses 20 and 8 are evidently a pair of very similar and perhaps contemporaneous houses from an early phase of the functioning of the settlement, but which had no continuation in this cluster.

House 12, probably the largest at this site (246 m²), located on the E periphery of the village, formed a separate unit which was further distinguished by the presence of an enclosure, ca. 20 x 18 m in size, on its western side, and was built centrally on the plan of a slightly smaller and older house 12a.

Of particular significance is the position near the centre of the village of houses 30, 31 and 33, which form a three-phase succession arrangement. They were built as part of a larger cluster of houses which also includes on the W side houses 18 and 39 (a two-phase arrangement; these houses are poorly preserved and will not be analysed further), and on the E side houses 3 and 25 (also a two-phase arrangement). In this cluster the oldest houses were houses 31 and 3, which undoubtedly formed a pair. After these were abandoned, the next pair of houses 30 and 25 were built in their place, with house 30 being built exactly
on top of house 31, albeit about 1/3 longer than it, while house 25 was only partially superposed on house 3, and was positioned in parallel to house 30 and had a similar layout with a characteristic dividing wall inside. The youngest in this cluster is house 33, which functioned alone, and was built almost exactly on the foundations of house 30, but extending it significantly on the southern side, meaning that its surface area increased almost twofold compared with the previous house. In essence, houses 30, 31 and 33 were built in exactly the same place and retained the same orientation, yet were extended by about 1/3 in each younger version.

Houses 2-4-6 are three solid houses from the youngest phase of the functioning of the settlement, whose orientation and mutual position indicate that they formed an assemblage of most probably synchronously functioning houses. These houses are layered on several other houses, of which only houses 37 and 5 had an identical orientation and could be considered as “founding houses” in this cluster. It is not clear, however, what the relationship was with house 15, which is bisected by them, and which formed a functional pair with house 13. We are probably dealing with a three-phase (if we consider that houses 15 and 5 could have been contemporaneous) cluster of houses of which the oldest was the individually functioning house 37. After house 37 was abandoned, house 5 was built and to the north of house 5 a separate pair of houses 15 and 13. This sequence ended with the aforementioned threesome of solid houses 2, 4 and 6, which could integrate the inhabitants of three houses from the previous phase.

A separate problem is the row of nine single houses, unique on the scale of the whole site, located at its centre, starting from house 22 in the N up to house 19 in the S (houses 22, 1, 24, 26, 52, 27, 19B, 19A). It is very difficult to interpret chronologically since not all of the stratigraphic relations are obvious and many potential relations are missing because of the broken line of foundation ditches. This may also be connected with the problem of identifying some of the dwellings. We believe that in the S part of the analysed sequence, we should additionally identify houses 19A and 19B. Another problem is the possibility of the synchronous functioning of some of the dwellings, e.g. 52 and 27, which seem to be the oldest in this sequence, and could have functioned as a pair. Whether this is the case or not, what we see here is at least a five-phase sequence of reconstruction (e.g. 52-56-24-1-22; house 22 could have been contemporaneous to house 2, which is also superposed on house 52 but does not form a new phase in this sequence, much like houses 19, 19A and 19B situated to the S of house 52). Generally we can say that after the oldest pair of houses (52 and 27) was abandoned, further buildings were developed in this cluster in the form of sequences of single houses, both towards the south (houses 19B-19-19A) and, mainly, towards the north (26-24-1-22).

Summing up the analysis of the settlement at Brześć Kujawski, it seems that it is a particularly significant case in considerations on the system of succession of houses because the decidedly dominant situation here is of new houses being built with reference to the location of previous dwellings. In our opinion it was a conscious decision and an expression of a symbolic continuation and not a necessity caused, for example, by the lack of space. At Brześć Kujawski there was enough space to build a new house on a spot free of previous occupation, as was the case in the majority of LBK settlements. So it was the system of house succession that caused the high building density and not the opposite. This seems similar to the system characteristic for tells and we cannot exclude for certain the possibility of a real reference to this idea that could have reached the Lowlands from the Carpathian Basin with other social transformations that will be presented below.

Pairs of Houses
The second phenomenon emerging distinctly at Brześć Kujawski (as well as at other BKK settlements) is the frequent occurrence of pairs of houses, particularly clearly visible when we analyse each of the building phases separately (Figure 6). The question therefore arises whether we are dealing here with two different systems of locating successive buildings even within the same clusters, or whether each group settling a given cluster used one system and, consequently, we should consider that the majority of the identified pairs of houses functioned synchronously as a complex household. In the case of Brześć Kujawski as well as Osłonki and other densely arranged settlements (Figure 5) we are inclined to agree with the latter hypothesis. An analysis of the remaining sparsely built-up settlements (Figure 4) inclines us, though, to identify the second system of building succession, involving building new houses next to abandoned houses. We are
inclined to consider that this second system, like the occurrence of houses in the form of clusters, refers to traditions originating in the LBK.

In summarising the analysis of the layout of BKK settlements as a whole, it is necessary to wonder how to interpret the differences in the layout of the settlements presented here, particularly the differences in the density of buildings. Analysing the plans of the settlements alone, it could be suggested that in the case of extensive but well-spaced sites, at which no superposition of housing plans is observed, the differences result from the shorter functioning of the settlement. So, analysing in detail two sites with very well-spaced buildings (Bodzia 1 and Kruszynek 6), we should emphasise that they functioned equally as long as Brześć Kujawski. The hypothesis that, in given cases, they were small hamlets with a relatively stable, fairly low number of inhabitants is, thus, justified. In essence, we are dealing with a clear ranking of settlements in which at one extreme are satellite sites (hamlets) and at the other central villages (Osłonki and Brześć Kujawski).

3.5 Size of Houses

Only from the area presented in Figure 2 do we know nowadays 13 sites and 168 longhouses of the BKK, 61 of them unearthed in complete plans. It is a solid basis for their characterisation. Above all, we should emphasise their far-reaching unification as regards the trapezoidal shape and construction based on a solid foundation trench and single internal row of posts, often not preserved. In general BKK houses (Figure 7) could have consisted of two rooms, but traces of partition walls are seldom visible. In some of the houses we also find a kind of vestibule, open to the south, created by extending the side walls. A certain diversity comes from the presence or absence of characteristic internal cellars and extensions at the side. Small evolutionary modifications are visible in the construction. The oldest buildings stand out due to their more trapezoidal shape and less solid, often discontinuous ditch.

Fig. 7. A. Examples of BKK houses from different parts of the Polish Lowlands: 1- Konary 1, house 6; 2- Bodzia 1, house 4; 3- Konary 1, house 2; 4- Brześć Kuj. 4, house 56; 5- Płękowo 6A, house 1; 6- Dubielewo 8. After: Grygiel 2008 (1, 3-5); Czerniak unpublished (2); Siwiejryn unpublished (6). B- Examples of Late SBK houses (1-2) and Lengyel Culture (3- Early, 4-5 – Late): 1 – Jaroměř (Czech R.); 2- Postoloprty (Czech R.), House 15; 3- Žlkovce (Slovakia), House 72; 4- Jelšovce (Slovakia); 5- Mosonszentmiklós (Hungary). After: Burgert et al. 2014, Fig. 5 (1); Pleinerová 1984: Fig. 16:11 (2); Pavuk 2012 (3-5).
The average surface area of a house for the analysed sample is 118 m² and the median 106 m². The smallest house was 30 m² and the largest 274 m². In Figure 8 the percentage share of sizes of houses divided into classes every 50 m² is presented for the whole sample and for individual sites with the number of houses greater than 6: Brześć Kujawski 4 (21 houses), Osłonki 1 (13 houses), Dubielewo 8 (9 houses) and Bodzia 1 (6 houses). Generally the breakdown for individual sites is surprisingly similar. In all cases, the most numerous group is that of medium-sized houses with dimensions of 81-130 m². There are single exceptionally small (about 30 m², BK4 and Dubielowo 8) and large houses – particularly house no. 5 in Bodzia stands out, with a surface area of 274 m². This shows that neither small nor large houses were restricted to any particular type of settlement but are recorded in large villages as well as in hamlets. It seems that in all of the cases a certain diversity in the dimensions was possible. There could be a connection here with chronology. For the houses investigated by R. Grygiel (2008) and dated to one of the three phases (as modified by us), there is a visible tendency for their dimensions to increase. Houses from phase I have an average size of 40 m², from phase II 103 m², while from phase III 122 m². The increase between phases I and II is especially striking, although this difference could result from the fact that only two houses are dated to phase I in such a state of preservation as to allow an estimate of their size. Houses from the early phase of settlement at Dubielewo 8 are also small and here, too, the tendency for the size to increase with time is generally confirmed – house 128 from the last phase has the largest surface area of 197 m², although there are no houses from the last class size of 231-280 m² at this site.

It is not known how much this diversity in the sizes of houses results from such factors as, for example, the number of inhabitants (the size of the household). On the whole, we do not comment on the matter of the size of the group inhabiting a house. Nevertheless, large differences in the size of houses reaching a factor of four might testify to different sizes of the household. On the other hand, the same effect could be attained in two ways: either through the dimensions or the number of houses forming one household. The connection between the size of the houses and the number of inhabitants seems to be justified by the fact that single large houses occur fairly frequently at sites where previously there were small houses, often occurring in pairs (the equivalent of one large one?).

**Fig. 8.** Size of BKK houses divided into five size classes.
A: Bodzia 1; B: Brześć Kujawski 4; C: Osłonki 1; D: Dubielewo 8; E: total

### 4 Burials

BKK is a culture where the tradition of burying the dead within a settlement survived, having originated from the LBK and its predecessors. It is another important feature, apart from the uniformity and monumentality of its houses, that distinguishes it from many other local Late Lengyel groups, where separate cemeteries are known.
As regards the number of graves (Table 1) among the settlements analysed here, two sites stand out clearly: Brześć Kuj. 4 and Osłonki 1, where the ratio of the number of graves to the number of houses is 1:7 and 3:1, respectively. We have to mention the observation of R. Grygiel (2008: 309) that on the first of these sites many shallow graves might have been destroyed so this ratio should be even higher, while for other well recognised settlements it varies between 0,3 (Bodzia 1) and 1,0 (Ludwinowo 3).

However, even in the case of settlements with numerous burials they do not represent the entire population (Czerniak and Pyzel 2013). According to some estimates even in the case of the population buried at Brześć Kujawski only about 20% of the dead were interred in settlement graves (Czerniak and Piontek 1980). It seems more probable that burials were much more communal ceremonies where selected individuals represented a larger group of dead. It is an older tradition, visible in the LBK and also in the Malice culture of South East Poland. Taking into account the fairly good state of field research in Kuyavia, the probability that separate cemeteries which could change this view will be discovered is very limited.

It is difficult to find criteria for selecting people to be buried in a settlement or in another way; they are seemingly not detectable for us. Most probably it was not the age or sex, as in the case of larger groups of burials on one site they seem to represent quite well a normal living population. The choice could have depended on other factors such as the time or cause of death, etc.

A much higher burial ratio in the two analysed central sites implies two possible hypotheses. In the first one, these settlements could have been burial places not only for their inhabitants but also for people from neighbouring satellite sites, originating (or only feeling that they did) from this particular large village. Burying the dead in the ‘settlements of ancestors’ (mainly invented) is evidenced in Kuyavia by the discovery of a BKK grave located in a borrowing pit associated with an LBK house at Ludwinowo 7 (Czerniak and Pyzel 2013). Secondly, inhabitants of a whole region could have regarded such central sites as a kind of separate cemetery.

In this context it is difficult to explain why very few single burials do occur in smaller settlements. Are they only reminiscent of an older tradition of locating single, selected graves close to a house?

Two central sites discussed here differ from others not only in the high number of burials but also in the especially rich and prestigious goods connected with some of them. R. Grygiel distinguishes between ordinary graves, graves with copper – these can be found on many different sites – and exceptionally rich graves with copper, restricted only to large villages such as Brześć Kujawski and Osłonki (Grygiel 2008: 899). In our opinion it does not necessarily mean that such central sites were accumulation points of any economic and political power, but, regarding the possibility of burying people from elsewhere there, they could much rather have been places of (real or invented) origin for a large regional community, where periodical ceremonies, encounters and exchange integrating inhabitants of many villages and hamlets took place.

5 Clusters of Sites

The spatial distribution of the settlements analysed here in detail is depicted in Figure 2. It covers the cluster of sites spread over an area of ca 500 km², so within a distance of two hours’ walking from the centre in each direction. Two central villages – Osłonki 1 (no. 4) and Brześć Kujawski 4 (no. 8) – lie at a distance of 8.5 km to each other. Bodzia 1 is the northernmost site (no. 1; 12 km from Brześć Kujawski) while Dubielewo 8 (no. 2) is located 7.5 km north of Brześć Kujawski. Sites at Kraszynek 6 (no. 11) and Ludwinowo 3 (no. 13) lie 10 km to the south of Brześć Kujawski. There are many other sites between them which have not been excavated but well illustrate the density of BKK occupation in this region.

Looking at the distance between the central sites at Brześć Kujawski and Osłonki, we should expect settlements of at least a similar rank at Kraszynek or Ludwinowo as well as at Dubielewo and Bodzia. Meanwhile, we find only small satellite settlements there (Figures 4 and 5). Of course, it cannot be excluded that further investigations will uncover central sites in their vicinity. However, it is more probable that we are dealing with a larger and more complex system of interdependence and hierarchy of the settlements, within which the settlements at Brześć Kujawski and Osłonki fulfilled a central role.
6 Discussion

Although it has been known for a long time that in the BKK small hamlets existed besides large central sites such as Brześć Kujawski and Oslonki (Czerniak 2002; Grygiel 2008), recent discoveries at Bodzia, Dubielewo, Kruzynek or Ludwinowo shed a new light on this situation. Firstly, it seems that these small, but quite numerous and long-lasting hamlets and farmsteads constituted a default standard for the BKK settlement system. Secondly, that large villages such as the extremely densely (tell-like) inhabited Brześć Kujawski or the fortified site of Oslonki were central sites within a hierarchical settlement network extending over relatively large areas of eastern Kuyavia. Judging by the high number of graves and their richness, which distinguishes these two sites, we think that they could also have been ritual centres integrating small local community groups mainly by communal burial ceremonies. Another argument for the existence of such a highly integrated settlement system is the very strong unification of the material culture and weak change dynamics during almost five centuries of the BKK development.

The description of the BKK settlement system presented above does not significantly differ from the picture of contemporary Chalcolithic groups from the Carpathian Basin, nor from that of the Tiszapolgar (e.g. Parkinson et al. 2010), or the Late Lengyel culture (e.g. Regenye 2013), although similar settlement processes originated there about one century earlier.

If we consider the material culture as well as burial rites of the BKK, which both reflected the existing social structure, we have no doubt that these communities acted within a Middle European contact network, which can be described as a Late Lengyel interaction sphere. It is especially visible in similar sets and decoration of pottery but also in the presence of copper, Spondylus, calcite artefacts as well as some lithic raw materials in the Lowlands. Nonetheless the strength of these contacts is particularly expressed by a new social structure, which can be defined as a Chalcolithic one. First of all, it was signified by totally different defined social roles and identities of men and women. Distinctive gender-oriented identity can be explored, for example, in female-specific outfits and ornaments such as cattle rib armlets, hip belts made of shells and special types of necklaces as well as male-specific items such as axes, bone daggers and pendants. The high correspondence between body orientation and biological sex in graves – men buried on the right, women on the left side – can be in general interpreted as an indicator of a gendered structure as well. However, this custom might also have concerned the social position because we do encounter female burials placed in the ‘male position’. Less obvious seems to be the individual diversity in social status at this time, as may be suggested by the diversity of burial gifts. If individual graves were in themselves already the representation of some greater community, then their decoration could express more complex circumstances and social relations. The hierarchical settlement network could also be defined as Chalcolithic.

A specific element which distinguishes BKK communities against this background seems to be the highly unified settlements, regardless of size, and the monumental longhouses built on solid foundation trenches (Figure 7A). Denoting the BKK longhouses as exceptional requires some justification, of course, because formally similar houses, mainly rectangular, but also trapezoidal, occur at this time both in the Late Lengyel (e.g. Vokolek and Zápotocký 2009; Podborský 2011; Pavúk 2012, e.g. Fig. 7B) and Tiszapolgar cultures (Parkinson et al. 2010) as well as even further, for example in the Balaton-Lasinja culture (Oross et al. 2010). The constructional and functional solutions of BKK houses reflect in general many innovations that emerged much earlier, in the second quarter of the 5th millennium in the Carpathian Basin. Here we might mention the following: (1) supporting the main construction of the roof and, if necessary, the second floor, on posts of the side walls secured in foundation trenches, (2) reduction in the number of internal posts to a single row of only a few posts (3) reduction in size and relocation of borrowing pits from a location typical for the LBK along the side walls in proximity to the N gable wall, and also (4) the division into two rooms and the introduction in the case of some houses of annexes (cf. Podborský 2011; Pavúk 2012).

Another issue which must be more thoroughly studied in the future is the recognised variability in the pattern of house succession. It seems significant that two systems existed simultaneously: on the one hand the erection of a new building beside an old one and on the other the construction exactly on the same spot of a predecessor. The problem is that the first model can be interpreted either as a more conservative one, tracing back to the LBK tradition, or a progressive one referring to a transformation that took place.
in the Carpathian Basin and the Balkans after the abandonment of tells. Another significant point is that
the greatest differences in the system of house succession seem to occur in the case of two not so distant
and, more importantly, the largest central sites of the whole region at Osłonki and Brześć Kujawski. It may
indicate much more essential diversity and concurrence between separate groups than suggested by the
strong uniformity of the material culture.

In the peculiar trapezoidal shape of BKK houses one can recognise patterns originating from the western
zone of the late post-LBK cultures, especially from late SBK phases in Bohemia (Burgert et al. 2014). Taking
into account the style of ceramics, we are also inclined to link the genesis of BKK houses with the influences,
or rather the tradition, of the latter. Thus, speaking of the specific nature of the longhouses of the BKK, we
have in mind only their common and plentiful occurrence regardless of the size of the settlement, strong
formal unification and also their much larger size on average, justifying the term monumental.

Against the background above, the exceptional role of the house in the BKK is clear. Thus it seems valid
to interpret this form of house as a symbol expressing the identity of the BKK community. In this regard, the
BKK house can be compared rather with the iconic nature of the LBK house than with its contemporary Late
Lengyel house. We doubt, however, that it was an expression of continuation or a kind of conservatism.
The four-hundred-year hiatus and social changes which took place between the decline of the LBK and the
emergence of the BKK incline us to search for another interpretation.

In our opinion, both the strong regional integration of the BKK community based on a network of
intensive contacts and the visible need to possess a symbol serving as a way of identifying with the group
could have been the result of a confrontation, more frequent than elsewhere, with groups of a decidedly
different cultural identity. In the Polish Lowlands communities of the BKK lived on the northern fringe of
farming cultures, where contacts with hunter-gatherers must have been particularly intense. Furthermore
in the last quarter of the 5th millennium the Funnel Beaker culture (further TRB) emerged on the Polish
Lowland and settled down in very specific environmental conditions of sandy enclaves, sometimes very
close to the areas inhabited by the BKK people (Figure 3).

As a consequence a cultural mosaic emerged, particularly complex in regions with a long tradition
of Danubian culture settlement such as Kuyavia, Greater Poland, Chełmno Land or Pyrzyce in the Lower
Oder region. In this confrontation their own symbols played a crucial role in creating and fostering the
community identity. In this regard the material culture of all societies inhabiting the Polish Lowlands in
the 2nd half of the 5th millennium was significantly distinctive. In the case of the BKK such a symbolic role,
iconic for the whole community, like in the LBK, could have been played by the longhouse. We suppose
that the longest and most solid buildings were constructed in the younger phase of the BKK when the TRB
societies emerged in their vicinity. The enclosure at Osłonki, dug in the younger occupational phase of this
site, could have been an expression of a similar symbolism, maybe in the context of confrontation with the
TRB (Grygiel 2008).

So far we have found out the most about contacts between the BKK and local hunters and gatherers.
They are evidenced by pottery vessels, stone tools and bone ornaments recorded quite frequently on sites of
the Ertebølle culture (Terberger and Kabaciński 2010; Czekaj-Zastawny et al. 2013; Czerniak 2007, Czerniak
2012a). Also in the BKK we can recognise many features adopted from hunter-gatherer communities, not
only exotic items such as, for example, amber artefacts, but also influences (resemblance) in elements of
an outfit, for example, necklaces made of wild animal teeth. There are also syncretic items such as armlets,
typical for Danubian cultures, where they were made of Spondylus shells, marble or calcite. In the Lowlands,
however, armlets were made of cattle ribs and were additionally richly ornamented in a manner resembling
the decoration of Mesolithic bone artefacts. T-shaped antler axes, very popular in the BKK, could have been
adopted from hunter-gatherers, but they were doubtlessly locally produced in the BKK and – as indicated
by grave inventories – had a similar function as stone axes in the Carpathian Basin, where they symbolised
the social role of males. The process of not only confrontation, but also gradual integration, of hunter-
gatherer and “Danubian” societies is highlighted by recent DNA analysis as well (Lorkiewicz et al. 2015).

Meanwhile the mutual relationship between the BKK and the TRB communities has not been greatly
highlighted or comprehensively examined so far. However, recent C14 datings for both cultures clearly

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demonstrate that they existed simultaneously for at least two or even three centuries (Figure 3). These data are in concordance with previous observations that sites of the early TRB in Kuyavia and Greater Poland were located only on sandy soils, so outside enclaves exploited by BKK communities, albeit often in their vicinity. However, taking up these issues is not possible without tackling explicitly the problem of how to interpret the origins of the TRB (e.g. Rzepecki 2011; Czerniak 2012a), which would take us far beyond the topic of this paper.

References


