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Early Neolithic Sites at Brześć Kujawski, Poland: Preliminary Report on the 1980–1984 Excavations

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Since 1976, excavations have been conducted on two neighboring Early Neolithic sites at Brześć Kujawski, Poland. The original goals of this research, to obtain a radiocarbon-supported sequence of Early Neolithic cultures of the Polish Lowlands and to recover paleobotanical and faunal remains, have been expanded to include the investigation of household activities and regional settlement distribution. Further analysis of faunal and botanical remains has improved our understanding of the prehistoric economy. Finally, a series of human skeletons has yielded the first paleopathological data for this site.

Introduction

Since 1976, the authors have conducted excavations at a complex of Early Neolithic sites at Brześć Kujawski, Włocławek district, located approximately 150 km NW of Warsaw in the Kujawy region of Poland (FIG. 1). At this writing, nine excavation seasons, totalling over 24 months, have been completed. A preliminary report on the 1976–1979 excavations was published in 1981,¹ and this article provides a preliminary report on the results of the 1980–1984 excavations. So far, our excavations at Brześć Kujawski have focused on two sites, identified as Sites 3 and 4. Excavations at Site 3 closed in 1979, while 1984 was the final season of work on Site 4. Our research at other sites in the Brześć Kujawski area, however, will continue.

Our excavations since 1976 have represented a continuation of the work of the late Professor Konrad Jażdżewski before World War II.² When the excavations were reopened in 1976, our main goals were the development of a radiocarbon-supported chronology of the Early Neolithic cultures of the Polish Lowlands and the recovery of archaeozoological and paleoethnobotanical data in order to reconstruct the subsistence economy of

the early farmers of the North European Plain. After the first four seasons of excavation, we had achieved some progress in addressing these questions. Although we have continued to focus on these goals during the most recent excavations, new questions have arisen concerning the internal organization of the settlement and the relationship of the early food-producing communities of this area to the indigenous foraging populations. Our research has simultaneously become more regional in scope as well as focused on the individual residential units of the Neolithic settlement at Brześć Kujawski.

The microregion surrounding Brześć Kujawski provides an ideal location for the pursuit of such multifaceted research. In addition to the complex of Neolithic sites which span the period between 4500 and 3000 radiocarbon years b.c. (ca. 5300–3800 B.C.), there are numerous other coeval sites within a 5–8 km radius which permit the reconstruction of the Neolithic settlement system in some detail. Excavations at Brześć Kujawski have been combined with surveys and excavations at a number of these outlying sites, and we hope ultimately to understand the variability among them as well as their chronology and economy.

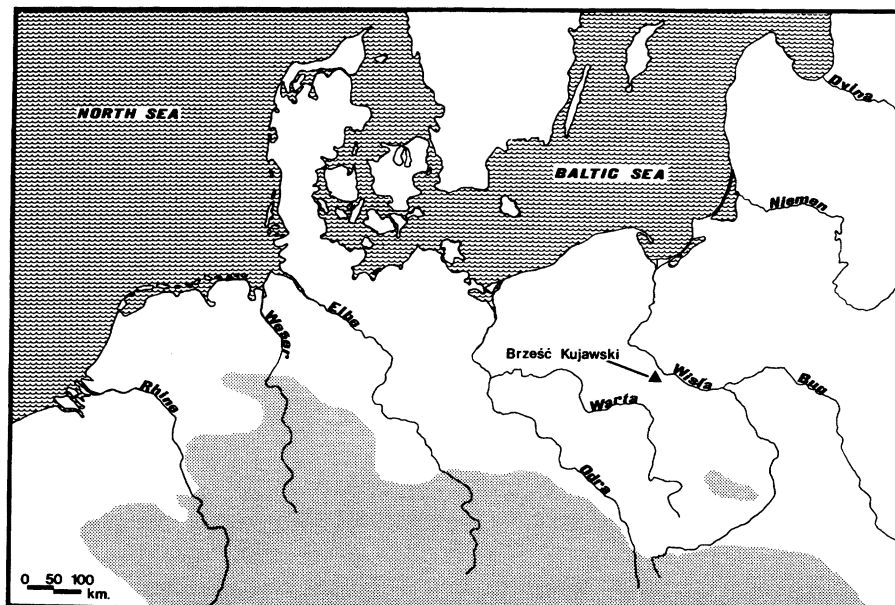
Context and Significance of Research

The fundamental issue underlying our research at Brześć Kujawski is the establishment of food-producing communities on the lowlands of the North European Plain. The majority of the earliest agrarian settlements

1. R. Grygiel and P. Bogucki, "Early Neolithic Sites at Brześć Kujawski, Poland: Preliminary Report on the 1976–1979 Excavations," *JFA* 8 (1981) 9–27.

2. K. Jażdżewski, "Cmentarzyska Kultury Ceramiki Wstęgowej i Związane z Nimi Ślady Osadnictwa w Brześciu Kujawskim," *Wiadomości Archeologiczne* 15 (1938) 1–105.

Figure 1. Map of northeast-central Europe showing the location of Brześć Kujawski. Shaded area in the south indicates land over 300 m above sea level.



of temperate Europe, dating to the fifth millennium B.C., are located largely in the central European upland zone in areas covered by loess, a fine wind-deposited soil. The loess belt presented the early farmers with a similar set of landforms and soil types from Slovakia to eastern France, and the colonization of this zone by agrarian communities was relatively rapid. Their settlements, characterized by timber longhouses, are found on the edges of the floodplains of the smaller rivers which drain the loess. There is a striking similarity of house types, ceramics, flint tools, and settlement locations throughout the loess belt at this time.³

The lowland habitat of the North European Plain, on the other hand, is markedly different from the upland zone. In this area, the final Pleistocene glaciation had a significant impact on the soils, drainage, and landforms. Substantial communities of indigenous hunter-gatherers were supported by the diverse natural resources of the North European Plain. Agricultural communities on the scale of those found in the loess belt were not established in the region until almost a millennium after their first appearance in the upland zone. The Neolithic settlements at Brześć Kujawski are among the earliest agrarian communities on the North European Plain. These sites have provided data on many aspects of the way of life in early food-producing settlements in the lowland zone, and we

have tried to explore a number of dimensions of prehistoric adaptations within it. Relatively few such sites have been fully excavated on the North European Plain, and there has not been a widespread effort to investigate questions of economic and social organization.⁴

In broader terms, the research at Brześć Kujawski may be of interest to researchers examining a number of questions. The establishment of agrarian communities in temperate Europe during the fifth and fourth millennia B.C. has relevance for the study of the general process of colonization, especially from an ecological perspective. It may ultimately be possible to draw broad parallels between the European case and other colonizations of temperate habitats, especially in North America.⁵ In particular, the nature of the settlement at Brześć Kujawski lends itself to the study of household variability within a Neolithic community in terms of the organization of household activities, which is of recent interest to both archaeologists and social anthropologists.⁶

3. Recent general works dealing with this issue have included R. Dennell, *European Economic Prehistory* (London 1983); T. Champion, C. Gamble, S. Shennan, and A. Whittle, *Prehistoric Europe* (London 1984); M. Jarman, G. Bailey, and H. Jarman, *Early European Agriculture* (Cambridge 1982).

4. Additional discussion of the introduction of food-production to this general area can be found in M. Zvebil and P. Rowley-Conwy, "Transition to Farming in Northern Europe: a Hunter-Gatherer Perspective," *Norwegian Archaeological Review* 17 (1984) 104–128.

5. S. Green, "The Agricultural Colonization of Temperate Forest Habitats: an Ecological Model," in W. Savage and S. Thompson, eds., *The Frontier: Comparative Studies* (Norman, Oklahoma 1979) 69–103; M. O'Brien, *Grassland, Forest, and Historical Settlement* (Lincoln and London 1984).

6. K. Flannery, ed., *The Early Mesoamerican Village* (New York, San Francisco, and London 1976); R. Netting, R. Wilk, and E. Arnould, eds., *Households* (Berkeley and Los Angeles 1984).



Figure 2. Brześć Kujawski and vicinity, showing topography in 5 m contours. Main sites discussed in the article are numbered 3 and 4.

Environmental Setting

The area surrounding Brześć Kujawski presents a complex mosaic of landforms and soils, as do most parts of the Polish Lowlands. Most of the terrain features are subtle remnants of the glacial and periglacial processes that occurred across this area at the very end of the Pleistocene. What appears to be a relatively undifferentiated landscape at first glance actually contains numerous features which contributed to the diversity of the prehistoric environment.

Brześć Kujawski (52°36'N, 18°35'E) is located at the eastern end of the Radziejów Plain, a flat expanse on the west bank of the Vistula River. This area forms a watershed between the Warsaw-Berlin and the Toruń-Eberswalde glacial meltwater valleys. To the south and west of the sites, the plain is covered by a ground moraine composed primarily of boulder clay deposited during the later stages of the Weichsel (= Alpine Würm) glaciation.⁷ To the north, and especially to the northeast of Brześć Kujawski, there is an area of sands and gravels in which small patches of boulder clay are found. It appears that these were deposited immediately after the retreat of the ice sheet, when glacial meltwaters swelled the Vistula River to the point that it overflowed into this area and eroded the pre-existing ground moraine.⁸ There

is thus an ecological division between the areas to the south and west of Brześć Kujawski and the area to the north and NE. This separation appears to have had an effect upon the distribution of prehistoric settlement in the region.

Across this area are other traces of the glacial and periglacial environment of the late Pleistocene and early Holocene, many of which played a significant role in the prehistoric settlement of this region. Kettle-lakes formed by the melting of buried blocks of ice, probably during the Allerød period, dot the areas covered by ground moraine. The largest of these is Lake Smętowo, on which the main Early Neolithic sites at Brześć Kujawski are located (FIG. 2). Other glacial elements in the landscape include the troughs and depressions that carried glacial meltwater beneath the ice sheet. The most visible trough conducts the Zgłowiączka River through the Brześć Kujawski area, where it is joined by the Bachorza Valley, another trough that runs to the west of Brześć Kujawski. Today, the Bachorza channel carries a mere trickle of water, but during the Neolithic occupation it was probably a flowing stream. Another channel drains towards the east from the Smętowo basin, while smaller troughs are found north of Smętowo in the bend of the Zgłowiączka. The ecological diversity promoted by these glacial elements in the overall homogeneity of the ground moraine was probably a key factor in attracting prehistoric communities to the Brześć Kujawski area.

7. B. Nowaczyk, "Sytuacja Geomorfologiczna Osad Kultury Ceramiki Wstęgowej Rytej w Brześciu Kujawskim," *Prace i Materiały Muzeum Archeologicznego i Etnograficznego w Łodzi* 23 (1976) 115-120.

8. E. Wiśniewski, "Origin of the Vistula Water-Gap Between the

Plock and Toruń Basins," *Geographica Polonica* 33 (1976) 41-54.

A major gap in our understanding of the prehistoric environment of the Brześć Kujawski area has been the lack of palynological data. We hope that this situation will be corrected in either 1985 or 1986. There are several promising pollen basins in the area, including Lake Smętowo adjacent to Sites 3 and 4. One of the major goals of this research will be an understanding of the human impact on the ecosystem, particularly during the Neolithic occupation of Brześć Kujawski.

History of Research

The Brześć Kujawski area has been known to be rich in archaeological sites for over 50 years. Twenty-three sites are known from the township of Brześć Kujawski itself, spanning the entire 10,000-year period from the Late Paleolithic through the Middle Ages. Numerous additional sites have been found in adjacent villages. Rapid development and intensified agricultural activity, especially mechanized plowing, are threatening many of them.

Between 1933 and 1939, Prof. Jażdżewski carried out excavations on Sites 3 and 4 at Brześć Kujawski, where sand- and gravel-digging by local farmers had revealed human skeletons, pottery, and animal bones.⁹ In all, Jażdżewski and his assistant, Stanisław Madajski, excavated 11,425 sq m on the two sites. On the basis of Jażdżewski's work, the Neolithic sites at Brześć Kujawski, particularly Site 4, became well-known in European archaeological literature. World War II brought a halt to this work, and aside from a brief season in 1952 by Maria and Waldemar Chmielewski, the sites remained untouched until the authors began their work in 1976.

In 1976 and 1977, excavations focused on Site 4, where 850 sq m were excavated in the course of the two field seasons.¹⁰ This work established the fact that there were still archaeological remains at these sites and that there was superb preservation of faunal and botanical materials. In order to be consistent with Jażdżewski's documentation, a grid of contiguous 5 × 5 m excavation units was used. The plow zone, approximately 30 cm thick, was removed by shovel as a single unit, while the humic layer was trowelled by 10 cm levels owing to the lack of discernible stratification. When the interface between the humic layer and the sterile gravel, sand, or clay subsoil was reached, the prehistoric features which had been dug into the subsoil could be identified, mapped, sectioned, and finally excavated completely.

During the 1978 and 1979 seasons, our attention

shifted to Site 3, which was scheduled to be covered by small garden plots, thus precluding future excavation there.¹¹ Site 3 provided an excellent opportunity for opening up wide areas of the Neolithic settlement, for we were aware that the cultural sequence in this area was less complicated than on Site 4. During these two seasons, an area of 1,500 sq m was excavated, using basically the same excavation techniques as were used on Site 4. The lack of a well-defined humic layer on Site 3 also simplified the exposure of a broad area. We are reasonably confident that between our excavations and those of Jażdżewski, virtually the entire area of Neolithic settlement on Site 3 has been excavated. Borings beyond the area of excavation indicated that there is almost no prehistoric settlement elsewhere in the area of this complex of sites. The establishment of the garden plots in late 1979 effectively closed Site 3 to archaeological research.

The 1980–1984 Excavations

In 1980, when excavations were resumed on Site 4, we were able to apply many of the lessons learned on Site 3, especially concerning the need to expose wide areas at a single time in order to understand the spatial relationships among features. The southern part of Site 4, excavated by Jażdżewski, was a complicated palimpsest of overlapping house outlines and pits, a situation also encountered in the area excavated in 1976–1977. On the basis of our work on Site 3, we thought that the investigation of less densely-occupied areas on the fringes of the settlement might help in sorting out the components of the individual residential units.

During the five field seasons from 1980 to 1984, a total of 3,275 sq m was excavated on the northern fringe of Site 4 (FIG. 3). We had previously thought that this area was rather unpromising archaeologically, because of the lack of materials in earlier test trenches dug in its direction. This supposition was clearly incorrect, for a total of 80 pits, of various periods and serving various functions, 11 graves, and one large trapezoidal long-house were uncovered. All of these cultural features were found beneath a plow zone approximately 0.30 m thick. As we had hoped, the distribution of features in this area was more dispersed than in other parts of Site 4, and the disturbance of the Neolithic features by pits and postholes of later periods was relatively rare.

The Early Neolithic sequence at Brześć Kujawski spans the period between ca. 4500 and 3000 b.c. (uncalibrated dates). There are three components in the sequence: the Linear Pottery Culture (ca. 4500–4000

9. Jażdżewski, loc. cit. (in note 2).

10. Grygiel and Bogucki, loc. cit. (in note 1).

11. Ibid.

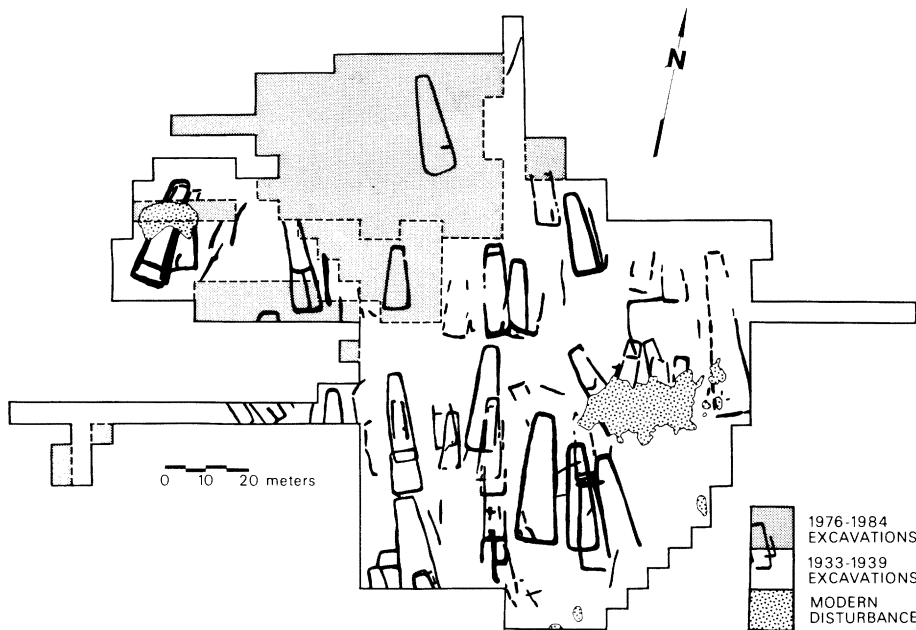


Figure 3. Plan of the Neolithic settlement on Site 4 at Brześć Kujawski, showing outlines of trapezoidal houses of the Late Lengyel Culture (Brześć Kujawski Group). The location of the 1980–1984 excavations is in the northern sector of the shaded area.

b.c.), the Early Lengyel Culture (ca. 4000–3600 b.c.), and the Late Lengyel Culture, represented by the variant found in the Polish Lowlands, the “Brześć Kujawski Group” (ca. 3600–3200 b.c.).¹² Of these, the Linear Pottery Culture and the Brześć Kujawski Group are the best-represented. Only a few features belonging to the Early Lengyel Culture had been found on Site 4 during the 1976–1977 seasons. These could be dated to immediately before the appearance of the Brześć Kujawski Group, ca. 3600/3500 b.c. It therefore appears that there was a gap in the occupation of Sites 3 and 4 between 4000 and 3600 b.c. In the near future, we hope to investigate Site 5, just to the north of Site 4, which may shed some further light on this question.

Most of the Neolithic features in the area excavated in 1980–1984 were associated with the Brześć Kujawski Group of the Lengyel Culture (ca. 3600–3200 b.c.), the major Neolithic component in the Brześć Kujawski sequence. This group was named on the basis of Jażdżewski’s excavations at Brześć Kujawski in the 1930s and comprises a discrete set of ceramic attributes within the broader Lengyel Culture of eastern Europe.¹³ In addition, isolated flint objects from the Late Paleolithic (ca. 9000 b.c.) and several features of the Linear Pottery Culture, dating to ca. 4300–3900 b.c., were found. Among the Linear Pottery features were a number of postholes sug-

gesting a structure about 15 m long and 5 m wide. Other features in the area excavated in 1980–1984 belonged to the LaTène (Late Iron Age) period (ca. 500–300 b.c.). These features caused some slight disturbance to the Neolithic settlement remains.

The materials of the Brześć Kujawski Group were the most important and interesting aspects of the 1980–1984 excavations, and consequently they are the primary focus of the remainder of this article. Since the 1930s, the Lengyel occupation of Brześć Kujawski has been one of the largest and most-completely excavated Neolithic settlement components in Europe. The 1980–1984 excavations resulted in the establishment of the northern limit of the Lengyel settlement and provided important information on household activities. The focus on the Brześć Kujawski Group does not diminish the importance of the Linear Pottery and LaTène materials, however, and these will be treated more fully in subsequent publications.

Structural Remains and Features

The trapezoidal longhouses are the most impressive structural features found at Brześć Kujawski as well as at a number of other Lengyel sites in the Polish Lowlands. These houses are of relatively uniform dimensions, between 20 and 30 m in length and between 5 and 8 m in maximum width. Their primary characteristic is the use of bedding trenches into which posts were set, rather than individual postholes as is the case at many Early Neolithic sites elsewhere in temperate Europe. Two sites, Brześć Kujawski and Krusza Zamkowa, have

12. R. Grygiel, *Rozwój Kultur Ceramiki Wstęgowej na Kujawach*, unpublished Ph.D. dissertation, University of Warsaw (1979).

13. In American archaeological usage, the Brześć Kujawski Group would be termed a “focus.”

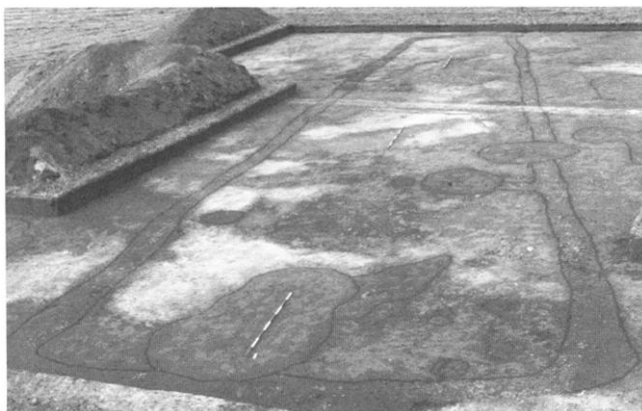


Figure 4. House 56, following the removal of the plow zone and humic layer; view towards the north. Segments in scale rods are 20 cm.

yielded the remains of a number of longhouses grouped into village-like configurations, while many other sites have yielded only single longhouses.¹⁴ The Lengyel trapezoidal longhouses clearly were residential structures, but the lack of other structural remains on these sites suggests that they also served a number of other functions, presumably as workshops, storehouses, and possibly stables. For that reason, it may be misleading to calculate population estimates for Lengyel settlements strictly on the basis of floor space. Rather, the trapezoi-

14. A number of sites with longhouses have been excavated in the Polish Lowlands, but only the site of Krusza Zamkowa approaches Brześć Kujawski in size. Further discussion of these settlements can be found in L. Czerniak, *Rozwój Społeczeństw Kultury Późnej Ceramiki Wstęgowej na Kujawach* (Poznań 1980) and R. Grygiel, *The Household Cluster as a Fundamental Social Unit of the Brześć Kujawski Group of the Lengyel Culture in the Polish Lowlands* (Łódź 1986).



Figure 5. House 56 with bedding trenches excavated to profiles; view towards the north. Segments in scale rods are 20 cm.

dal houses should be viewed as general-purpose structures rather than simply as shelters.

House 56

In the 1980 and 1981 seasons, a single Late Lengyel trapezoidal longhouse was the most important feature excavated (FIG. 4). This longhouse was 25 m long, 8 m wide at the southern end, and 3 m wide at the northern end. It was situated on the northern periphery of the settlement, which lacked any other structural remains. The bedding trenches of the house were about 30 cm wide and up to 1.5 m deep, dug into the morainic boulder clay which underlies this part of the site. The investigation of the fill in the bedding trenches was done using “mirror” sections, which permitted the detailed study of the arrangement of the posts (FIGS. 5, 6). There were many well-preserved elements, allowing examination of several aspects of the construction technique. In addition to the well-defined postholes along their bottoms, the bedding trenches contained a large amount of burnt wall-daub with impressions of structural elements such as posts and wattle.

The interior of House 56 was divided by partitions into three parts of more or less equal dimensions. The only traces of human activity were in the southernmost part, where a feature (partially destroyed by an Iron Age pit) containing lithic debitage was found. The presence of this material suggests that flint-working took place in this part of the structure. The remainder of the interior was devoid of features and midden deposits contemporary with the structure. The actual Neolithic ground surface was probably somewhat higher than the current interface between the humic layer and the subsoil, and the lack of visible stratification in the humic layer hampered the identification of the actual living surface within the house. It is also very possible that plowing and erosion have eradicated any traces of such surfaces during the millennia following the abandonment of the Neolithic settlement.

Household Features

During the 1982–1984 field seasons, the area surrounding House 56 was excavated. A wide range of cultural features was found in the immediate vicinity, most of which appear to have been coeval with the house itself (FIG. 7). These features, when taken together with the house, can be presumed to represent the archaeological remains of a single Neolithic household. In an earlier article, the authors proposed that in peripheral parts of the Brześć Kujawski settlement it might be possible to isolate such “household clusters” and to study the or-

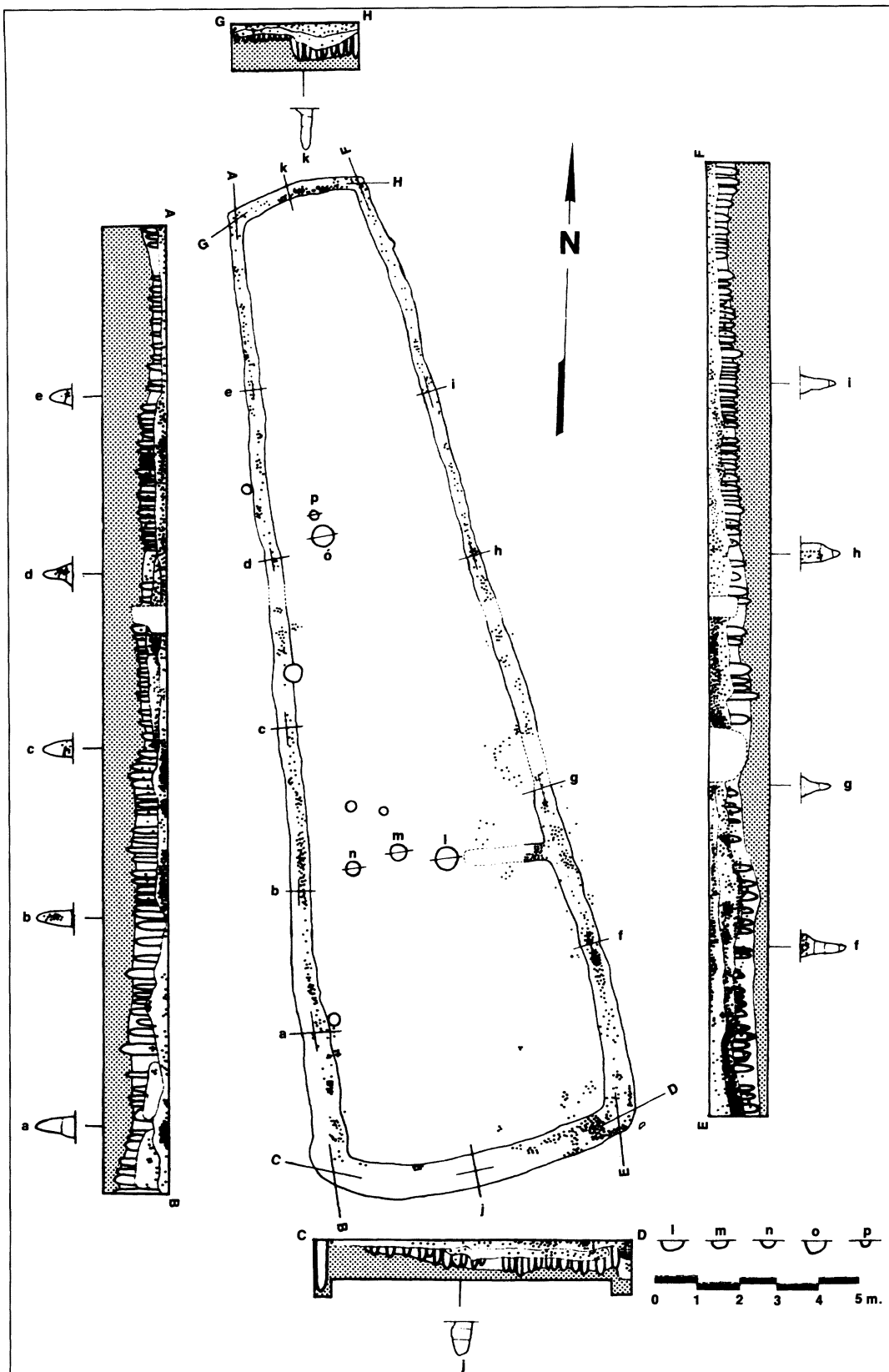
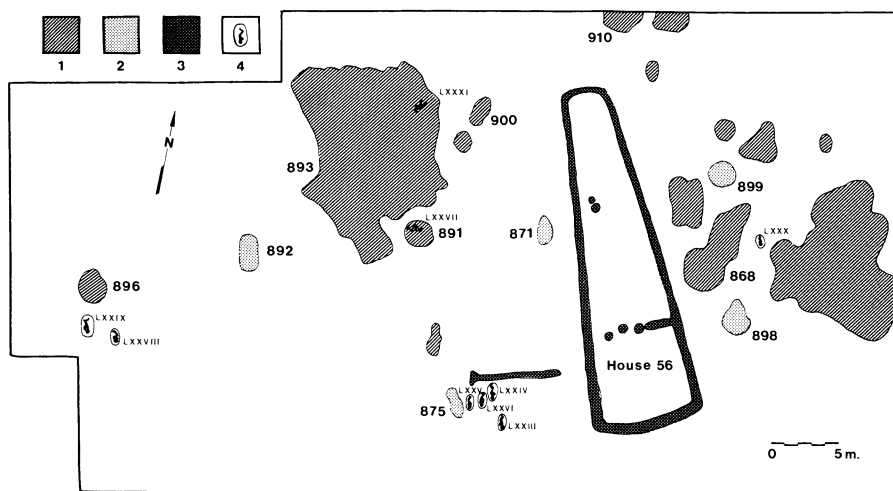


Figure 6. Plan of House 56, with sections showing the arrangement of posts. Dots indicate the density of burnt wall-daub in the bedding trench. Shaded area in sections beneath postmolds represents the sterile clay subsoil.

Figure 7. Household features surrounding House 56. 1. clay-extraction pits; 2. features associated with specific household activities; 3. structural features; 4. graves.



ganization of basic units of Neolithic society.¹⁵ The excavation of the household cluster around House 56 has provided a test of this assumption.

The Neolithic features in the vicinity of House 56 can be grouped into four general categories: clay-extraction pits, rubbish pits, special activity disposal features, and graves.

Clay-extraction pits

Several features near House 56 appear to have been the locations from which clay for construction, and possibly manufacturing, was taken.¹⁶ These are large features, up to 120 sq m in surface area and 2.5 m deep. In the area surrounding House 56, clay-extraction features occur in two places, on the eastern and northwestern sides of the house. The pits are characterized by small amounts of archaeological material, primarily rubbish, which found its way into them, both while the clay was being extracted and shortly thereafter. The rapid infilling of these features resulted in homogeneous fill which is confined to dark brown humus and clay. The largest of these features in the House 56 cluster (Pit 893)



Figure 8. Pit 892 with concentrations of scrap from antler-working and other artifacts. View facing north.

15. P. Bogucki and R. Grygiel, "The Household Cluster at Brześć Kujawski 3: Small-Site Methodology in the Polish Lowlands," *WA* 13 (1981) 59–72.

16. Such features are fairly common on Early Neolithic sites in temperate Europe. For a discussion, see O. Paret, "Vorgeschichtliche Wohngruben," *Germania* 26 (1942) 84–103; S. Milisauskas, "An Analysis of Linear Culture Longhouses at Olszanica B1, Poland," *WA* 4 (1972) 57–74; C. C. Bakels, *Four Linearbandkeramik Settlements and their Environment* (Leiden 1978).

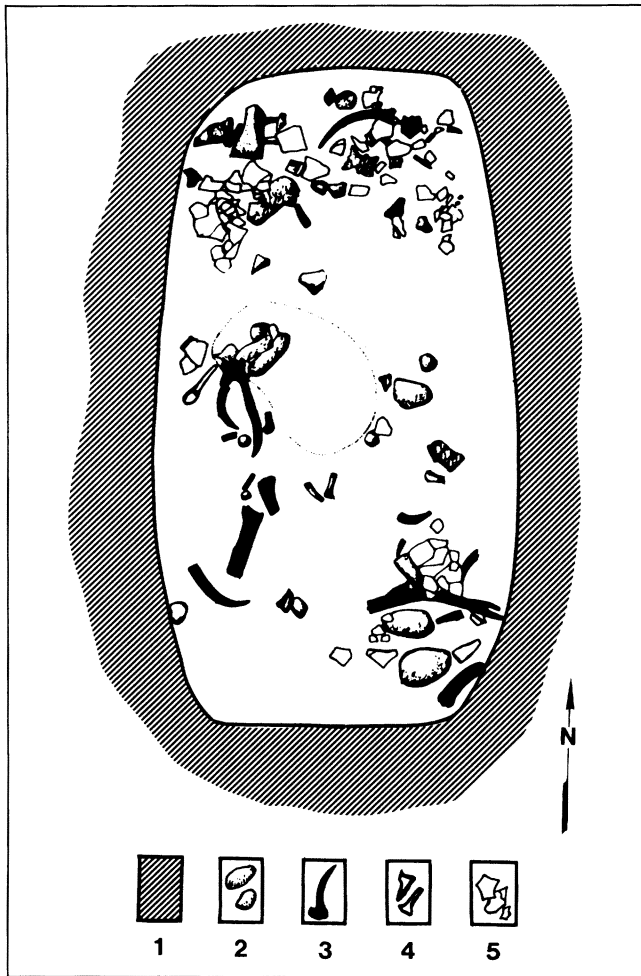


Figure 9. Plan of Pit 892, showing distribution of antler, sherds, bone, and stones: 1. sterile clay subsoil; 2. pebbles and boulders, some bearing traces of pounding and presumably used as hammer-stones and anvils; 3. antler scrap (bases, tines, and crowns); 4. bone fragments; 5. potsherds. Dotted line indicates extent of concentration of carbonized grain on bottom of feature.

contained several bone and antler tools, including mat-tocks and shovels, that had been used in clay-digging.

Rubbish pits

These features contain dense deposits of broken pottery, flint tools and debitage, animal bones, and other manufacturing by-products. Rubbish pits are small, apparently dug expressly for trash disposal, about 1 sq m in surface area. They are usually quite deep, however—up to 1.2 m (Pits 871 and 896). The density of artifacts in these is usually much greater than in the other types of pits.

Special activity/disposal features

These features are shallow pits which seem to have served as the foci for specific production activities or for storage. In some cases, they appear to have been specially dug, for they often have a regular plan and section (unlike the clay-extraction pits). These pits are always found in the hard morainic clay, which favored preservation of their shape while in use. The clay also permitted excellent preservation of organic materials, which have provided much new information on the manufacture of artifacts from antler, bone, and shell. Both finished products and manufacturing by-products were found. In the cases of those pits associated with production activities, it is unclear whether the activity took place within the pit or in the immediate vicinity (or both). The materials found in these features do not appear to represent general settlement rubbish randomly thrown into the pits but rather seem to have resulted from the accretional deposition of the by-products of distinct activities.

Axes made from red-deer antler are associated with several of the male burials elsewhere on Site 4. Although some antler scrap was found in features on Site 3 in 1978–1979, there was no clear indication of a special location for the working of antler. Two features in the vicinity of House 56 (Pits 892 and 898) did yield a range of by-products from antler-working, as well as unfinished, broken, and repaired antler artifacts. Pit 892 deserves particular attention (FIG. 8). Located about 18 m west of House 56, it had a rectangular outline, measuring 2.6×1.4 m and was dug into the boulder clay subsoil. The long axis was oriented N-S, like that of the house. All of the artifacts from this pit were found in several concentrations along the bottom (FIG. 9), including large granite rocks (some with traces of hammering and polishing), pottery, flint tools and debitage, animal bones and, above all, numerous pieces of red-deer antler. The entire assemblage appears to represent the by-products of a workshop for antler-working. A concentration of carbonized grain was also found in this deposit.

Pit 875 contains traces of hide-working. In the north-eastern part of this feature, the entire disarticulated skeleton of an adult sheep was found, along with a number of flint scrapers and knives. Particularly significant are the cut-marks on the skull. A common method of skinning such an animal in much of Eastern Europe today involves drawing the hide back over the carcass of the animal, starting from the hooves and finishing at the head, where the last connective tissues are cut away. It is possible that the marks on the skull of this sheep resulted from this final part of the skinning process. If so, it would not be the first time that evidence of hide-working has been recovered at Brześć Kujawski. In

1979, the disarticulated skeletons of five beavers were discovered in Pit 820 on Site 3, which also appeared to reflect hide or pelt removal on the basis of the condition of the bones and their association with flint knives and a blunt bone point.¹⁷

In a number of female burials on Site 4, large concentrations of beads made from freshwater-mussel shell were found. Two burials near House 56 alone produced over 8,000 beads, which were originally strung together and mostly lay in the vicinity of the hips. In Pits 871 and 893, two concentrations of fragmented shell were found, resulting from the process of manufacturing beads like those found in the graves. The shell scrap was in rubbish deposits, apparently having been gathered up from the manufacturing location and dumped in the pits.

The faunal remains recovered from Sites 3 and 4 indicate that the inhabitants exploited lacustrine fauna to a considerable degree. We have interpreted Pit 899 as a storage pit for food, such as turtles and shellfish. Such storage pits at Brześć Kujawski are characterized by regular bell-shaped profiles and were dug into the cohesive clay subsoil. Characteristically, there is a shallow basin in the bottom of these pits, below the level of the niches in the sides. Pit 899 was filled very rapidly, and contained a large quantity of burnt wall-daub. In 1978, a very similar pit, Pit 775, was excavated on Site 3.¹⁸ Both of these features, besides having a common profile, were located quite close to the prehistoric lakeshore.

Graves

Human burials are especially common features at Brześć Kujawski and, since the beginning of excavations in 1933, about 80 have been excavated on Sites 3 and 4. The graves are in the settlement, rather than being located in a separate cemetery at some distance, as is the pattern at many other Early Neolithic sites in central Europe. Within the limits of the features surrounding House 56, nine graves were found in several locations. The graves occurred either singly or in groups, the largest of which had four burials. Most were in specially-dug grave pits, while two were in rubbish pits. All were inhumations. In addition, a skull fragment was found in Pit 893, which suggests a destroyed grave in the vicinity. Fragments of human bones were found elsewhere on Sites 3 and 4, and the intense pit-digging and reconstruction of houses made it likely that graves of previous generations were often disturbed.

The burials at Brześć Kujawski, particularly those



Figure 10. Graves LXXIV–LXXVI near House 56. From left, graves are numbered LXXIV, LXXVI, and LXXV. Note the burial of the male on his right side and of the females on their left sides.

belonging to the period of maximum extent of the settlement, share a number of common features. The skeletons are in a contracted position, with the heads oriented S-SE. There are distinct sexual differences in the burial patterns, with male skeletons lying on their right sides and females on their left (FIG. 10). During the later occupation phase of the settlement, these characteristic burial practices seem to have ceased, since a number of graves excavated in 1978–1979 on Site 3 are in a variety of contexts, mostly in rubbish pits.¹⁹ The burials found during 1980–1984 in the House 56 cluster, however, all follow the “standard” Brześć Kujawski burial rite, and hence corroborate the dating of the features to the peak period of the settlement’s development.

The skeletal material from the House 56 cluster has been analyzed by Dr. Bogdan Łuczak, a biological anthropologist at the University of Łódź. In the course of the analysis, particular emphasis has been placed on the study of various pathologies, in order to assess the level of health among the inhabitants of Brześć Kujawski. The bones were exceptionally well-preserved in the clay subsoil, permitting detailed study of many anatomical elements. We hope that the entire corpus of human skeletal material from Brześć Kujawski will be analyzed soon and permit new insights into the biological characteristics of a Neolithic community. A summary of the age and sex determinations of the nine skeletons from the 1980–1984 excavations is presented in Table 1.

The most frequent health problems reflected by the skeletons are periodontal disease and abscesses on the gums. The burial of a female in Grave LXXIX exhibits

17. Grygiel and Bogucki, loc. cit. (in note 1).

18. Ibid.; Bogucki and Grygiel, loc. cit. (in note 15).

19. R. Grygiel, loc. cit. (in note 12); P. Bogucki, *Early Neolithic Subsistence and Settlement in the Polish Lowlands* (Oxford 1982).

Table 1. Summary of anthropological analysis of nine graves from 1980–1984 excavations at Brześć Kujawski. The sequence of graves in the table is according to the chronological order of their burial. The stature of the individuals is calculated on the basis of (a) long-bone length and (b) diameter of the long-bone epiphyses.

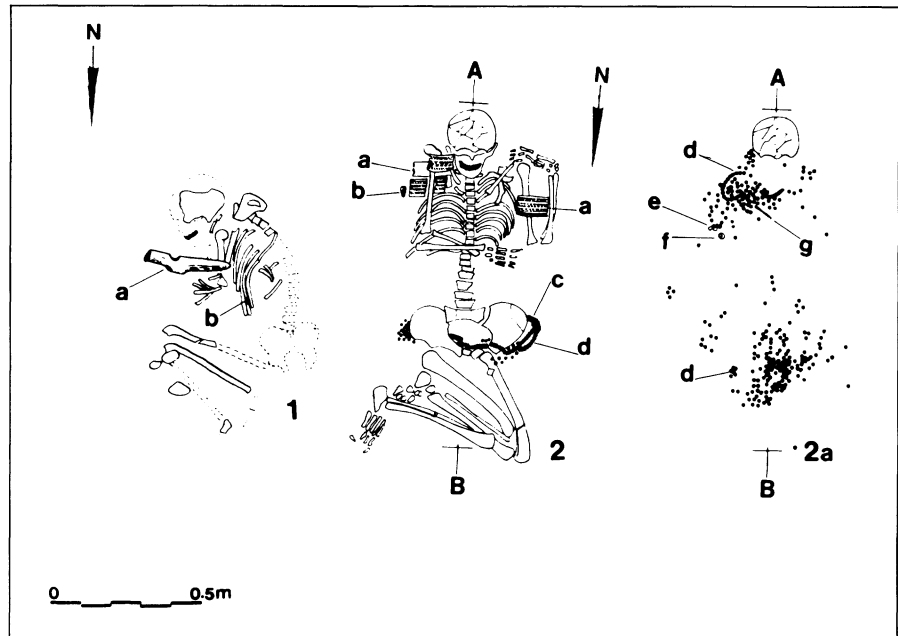
Grave number	Orientation	Sex	Age	Stature (cm)		Pathologies
				a	b	
LXXX	SSE	F	40–45	—	150.4	Traces of rather serious inflammation in the area of the roots of the upper left M1, M2, M3.
LXXV	S	F	65–70	—	151.6	Traces of inflammation along the upper right M, P1, and P2, and left P1, M1. Presence of a large Os Incae.
LXXVI	S	F	45–50	152.5	154.9	Severe lumbarization, I and IV sacral vertebrae.
LXXIV	S	M	50–55	168.3	168.7	Disproportion in size between the left eye socket (smaller) and the right (larger) and partial lumbarization of the I, IV, and V sacral vertebrae.
LXXIII	S	F	55–60	154.1	153.0	In M1, extensive dental caries near the root. Ante-mortem loss of P1 and P2 from left maxilla (shortly before death) and M1 and M2 from left mandible (long before death) as well as the right mandibular M1, M2, and M3 (shortly before death).
LXXIX	S	F	30–35	157.4	153.4	Ascending ramus of mandible fractured and offset medially (mended fracture). Dental caries near the root of the upper left M2 and the lower left M1. Abscess and fistula in the root area of the right upper I2.
LXXVIII	SE	M	50–60	—	164.1	Inflammation in the area of the right articular process of the mandible. In the maxilla, ante-mortem loss of the left teeth from P1 to M3.
LXXVII	E	F	35–40	—	—	Distinct traces of inflammation in the root areas of the upper left C and M1 as well as the right I2.
LXXXI	E	M?	14–15	—	—	Not ascertainable; skeleton poorly preserved.
LXXXII ?	?	child	7–8	—	—	Not ascertainable; only a skull without a mandible was preserved.

a range of dental problems. It is difficult to ascertain whether the serious abscesses around the roots of her teeth were related to the ultimate cause of her death, but the central area of the abscess had not yet cleared and healed by the time she died. In addition, the ascending ramus of her jaw was broken and offset medially, although it was fully-developed and mended. In the female burial in grave LXXIII, there are traces of healing around the spots where teeth were lost earlier in life. This range

of dental problems is consistent with what would be expected in an agricultural community that relied on soft foods for a large part of the diet.

Several of the graves were richly furnished, as is typical for burials from this period at Brześć Kujawski (FIG. 11). Personal ornaments are the most common forms of grave goods, including items made from shell, copper, animal teeth, and amber. Ceramics are rarely found in graves at Brześć Kujawski, and only one burial in the

Figure 11. Two graves from the area around House 56, dating somewhat later than those in Fig. 10. 1. Grave LXXVIII (a. antler axe; b. flint knives); 2 and 2a. Grave LXXIX (2a. location of objects 10–15 cm above skeleton; a. armlets from animal ribs; b. amber ornament; c. belemnite beads; d. shell beads; e. ornaments from animal teeth; f. amber ornament; g. copper beads).



House 56 cluster contained a vessel. Four graves (LXXV, LXXVI, LXXIX, and LXXX) contained copper beads. The copper ornaments at Brześć Kujawski are among the earliest in northern Europe.²⁰ The metal was presumably obtained from sources in the Carpathian region and reflects the links between the Brześć Kujawski community and areas to the south. Over the course of the Late Lengyel occupation at Brześć Kujawski, there is a progressive decline in the use of copper, suggesting that the source of the copper was somehow cut off. On this basis, Grave LXXX (with the most beads) is considered the earliest and Grave LXXIX (with a few small, thin beads) is thought to be the latest. Two female graves, LXXIII and LXXIX, contained considerable numbers of shell beads which were arranged in many strands around the pelvis and neck. Altogether, in both graves, over 8,000 beads were found. Other rich female burials are known from Brześć Kujawski and from other sites in the Polish Lowlands, but it is unusual to have two so close to each other.

The two graves which occur in rubbish pits are probably the latest in the group of nine. The practice of burial in rubbish pits is characteristic of the latest phase of the Brześć Kujawski Group, on the basis of evidence from Site 3. These later burials also completely lack grave goods, and the heads are not oriented toward the S-SE. One element of the earlier burial rite, burial of males on their right side and females on their left, was retained, however.

20. B. Ottaway, "The Earliest Copper Ornaments in Northern Europe," *ProcPS* 39 (1973) 294–331.

Technology

Ceramics

Among the ceramics of the Brześć Kujawski Group of the Lengyel Culture are seven basic vessel forms, all of which are found in the features associated with House 56 (a representative sample is shown in FIG. 12). In addition, there are some special forms which occur rarely in Late Lengyel contexts, including what appears to be a zoomorphic vessel from Pit 892, the feature with the antler scrap. Other ceramic artifacts include isolated fragments of clay spoons, spherical beads, and miniature vessels.

The actual amount of decoration on the Brześć Kujawski Group ceramics is minimal and is largely confined to the notching of the rims, waists, and, in one instance, the base of a vessel with fingernail impressions.²¹ An exception is the ornamentation on an amphora from Pit 868, on which there are angled incised lines with many smaller incisions at right angles. In addition to the notched decoration, a characteristic of the Late Lengyel Culture in general, is the use of lugs and appliques, usually on the lower part of the vessel. Some lugs are so large that they must have served as handles.

A number of pottery fragments with large vertically-perforated handles often appear to have served secondary uses after the breakage of the parent vessel. A number of such fragments from Pits 871 and 900 are heavily worn around their edges and had assumed an oval shape.

21. Grygiel and Bogucki, loc. cit. (in note 1).

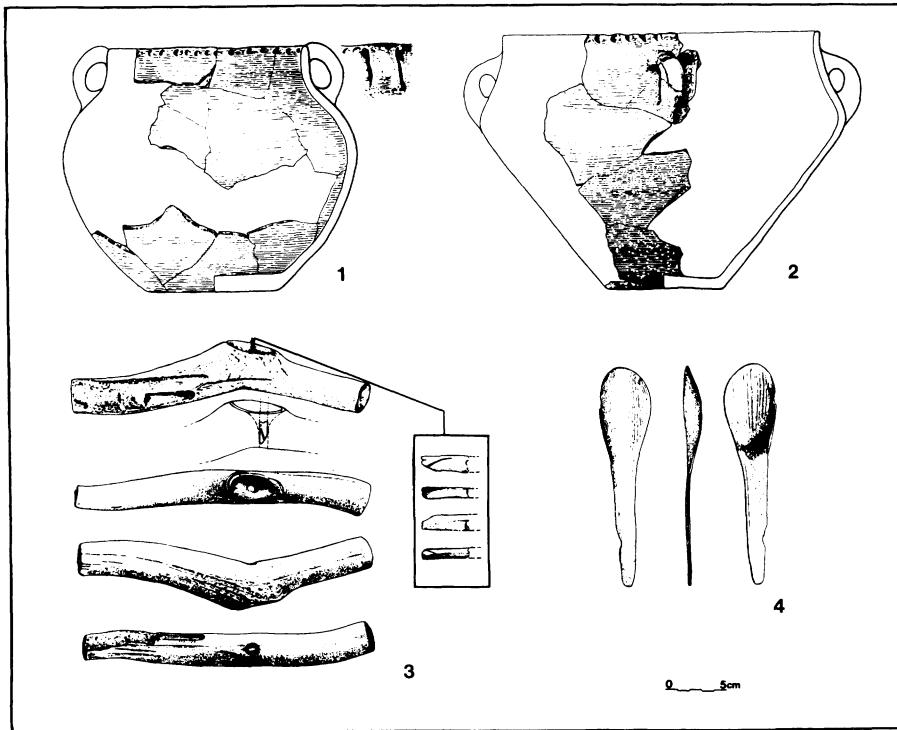


Figure 12. Selection of artifacts from Pits 892 and 898 at Brześć Kujawski. 1 and 2. representative Late Lengyel ceramics from Brześć Kujawski from Pit 892 (note relative lack of ornamentation); 3. unfinished antler axe from Pit 898 (inset shows bone drill lodged in shaft hole; scale is twice that of the rest of the illustration); 4. bone spoon from Pit 892.

The function of these worn fragments is unknown, but one possibility is their having served as loom weights.

Flint

Flint objects comprise the second most abundant category of artifacts at Brześć Kujawski. The basic raw material in the Late Lengyel assemblage from Brześć Kujawski is the local Baltic flint, which occurs as erratic pieces in the glacial gravels and clays of the Polish Lowlands. It is necessary to emphasize that imported raw materials were also used, although in considerably smaller quantity than the local flint. In particular, "chocolate" flint from the northeastern scarp of the Holy Cross Mountains in central Poland and Jurassic flint from the area of Kraków in southern Poland were used. Among the four basic classes of lithic artifacts—cores, blades, flakes, and finished tools—the "chocolate" and Jurassic flint are essentially represented in the Late Lengyel assemblage by tools. The exceptional quality of the imported flint is reflected by its ease of flaking as well as the fact that the size of the nodules made it possible to obtain blades that were almost twice as long as could be struck from the small pebbles of Baltic flint.

On the basis of the relative proportions of the four basic categories of flint artifacts listed above, it is possible to identify four different types of features: (1) those that contain by-products from the entire process of flint-

working; (2) those where the flint-working was limited to blade production; (3) those where finished tools were fabricated from blades brought in from elsewhere; and (4) general rubbish deposits with only debitage and exhausted cores, along with decortication flakes and broken tools. The types of raw material found in the different features also vary, with the very best imported flint being associated with the antler-working debris in Pit 892.

Antler

The antler scrap from Pit 892 revealed a number of details concerning antler-working, particularly the manufacture of antler axes. The raw material was obtained in the form of both shed antlers and antlers from slain red deer. In the latter case, the antler base was separated from the skull by chopping along the sutures, probably with a stone axe. In order to manufacture an antler axe, the beam of the antler was cut halfway through, then struck against an anvil to break off the base. This operation had two effects: it separated the unusable base from the beam; and it formed the rough shape of a working edge on the end of the beam. Then the tines along the beam were cut off, followed by the end of the beam leading to the crown. The remainder of the manufacturing sequence consisted of more detailed work. On the side of the beam opposite one of the spots where a tine had been removed, a flint tool was used to cut

through the hard outer tissue down to the spongy interior of the antler. A shaft-hole was then drilled through the spongy tissue using a bone drill. In a nearly-finished axe in Pit 898, a fragment of a bone drill was found lodged in the spongy tissue, blocking the shaft-hole and preventing further work on the axe (FIG. 12:3). Finally, the rough edge formed by the breaking of the beam was ground down to a smooth, angled surface.

Until the beginning of our research, the finished Lengyel antler axes had been found only in burials, and there was some suspicion that they were strictly ceremonial items. In Pit 892, however, were found several axes which had broken along the shaft-hole, evidently while being used. A new shaft-hole had then been drilled halfway between the old one and the working edge.

Bone

Two bone spoons were among the artifacts recovered from Pit 892. One of these is especially well-preserved (FIG. 12:4). Two unfinished examples have also been found, one of which had been thrown into the clay-extraction pit adjoining Pit 893. The half-finished spoons illustrate the technique of manufacture. First, the long bone of a large mammal was split lengthwise, after which the uneven edge was smoothed by polishing and grinding. The shape of the handle was produced by breaking the edges of the sides of the bone, and the scoop was formed from the spongy bone at the articular end using flint tools.

In addition to the spoons, a large number of bone points were found in several features. The function of these points, which are usually made from the metapodials of medium or large artiodactyls, is unclear, but they could have served a variety of purposes as awls.

Faunal Analysis

The analysis of the Late Lengyel faunal remains from the 1980–1984 seasons at Brześć Kujawski was done by Dr. Krystyna Susłowska and Dr. Krystyna Urbanowicz of the University of Łódź. Six features yielded samples of animal bones, totalling 316 identified specimens. The range of species and the relative proportions of the identified specimens are very similar to those identified for this period in the larger faunal sample from the 1976–1979 seasons.²² The smaller sample size reflects the lower density of Neolithic features in the area excavated in 1980–1984. In fact, the actual ratio of the number of

faunal specimens to the volume of feature fill is about the same as during the earlier seasons. Animal bones are generally very well preserved in the clay subsoil at Brześć Kujawski and thus permit identification to the species level in many cases.

As was the case in the faunal sample from the 1976–1979 seasons, domestic cattle (*Bos taurus*), domestic sheep and goat (*Ovis aries* and *Capra hircus*), and domestic and wild pigs (*Sus scrofa*) are the principal taxa represented.²³ Bones of domestic dogs are present in the sample from the 1976–1979 excavations, but it cannot be determined whether the *Canis* specimens from the 1980–1984 excavations are from dogs or wolves. Among wild mammals, red deer (*Cervus elaphus*), roe deer (*Capreolus capreolus*), and beaver (*Castor fiber*) are the most common. In addition, isolated specimens from small fur-bearing carnivores, the marten (*Martes martes*) and lynx (*Lynx lynx*), were found. Bones of domestic taxa (including pigs) outnumber those of wild mammals by a ratio of 4 to 1.

At the moment, only counts of identified specimens, rather than minimum numbers of individuals (MNI) or counts of articular ends of diagnostic bones, are available for the faunal data from 1980–1984. (In fact, using MNI as a measure of species abundance for such a small sample would be unsound.) When considered by themselves, the three principal taxa in the sample are present in the following proportions of identified specimens: domestic cattle (20%), sheep/goat (39%), domestic and wild pig (41%). These proportions are virtually identical to those found in the portion of the sample from the 1976–1979 excavations that corresponds chronologically to the period of occupation of House 56 and its environs. The relatively low number of cattle bones, however, should not be taken to indicate a subordinate economic role for this species. There is considerable evidence from other Early Neolithic sites in temperate Europe to indicate that dairying had already begun to play an important part in the economy, and cows may have been more useful while alive than as a source of meat.²⁴ While all cattle eventually were slaughtered, the number killed within any given period would have been proportionately fewer than that of the other stock used primarily for meat. The significant proportion of ovicaprids, as in the faunal sample from the area around House 56, has been

22. Bogucki, loc. cit. (in note 19); idem, "Patterns of Animal Exploitation in the Early Neolithic of the Polish Lowlands," in J. Clutton-Brock and C. Grigson, eds., *Animals and Archaeology: 4. Husbandry in Europe* (Oxford 1984) 35–44.

23. In an earlier publication dealing with faunal data from Brześć Kujawski, the argument was presented that a sharp distinction between domestic and wild pigs was artificial and potentially misleading when making economic interpretations (Bogucki, loc. cit. [in note 19]).

24. P. Bogucki, "Ceramic Sieves of the Linear Pottery Culture and their Economic Implications," *Oxford Journal of Archaeology* 3 (1984) 15–30.

Species	Number of Grains	Volume	Percentage of Specimens	Percentage of Volume
<i>Triticum dicoccum</i>	513	12 cu cm	65	53
<i>Triticum monococcum</i>	164	3.5 cu cm	21	15
<i>T. monococcum</i> or <i>T. dicoccum</i> ,	107	2 cu cm	14	11
<i>Hordeum vulgare</i> (?)	1	—	—	—
unidentified grain	fragments	5 cu cm	—	21
Totals	785	22.5 cu cm		

Table 2. Botanical analysis of carbonized grain from Pit 892.

observed at other coeval Late Lengyel sites in the Polish Lowlands, particularly in the region of Lake Pakość about 50 km west of Brześć Kujawski.²⁵ Extensive exploitation of pigs made considerable sense in the context of the agrarian economy; since pigs produce multiple offspring, grow quickly to their maximum meat weight, and can flourish in forested environments, they would have provided an important food resource for a sedentary agricultural community. In particular, keeping a large number of pigs would have helped offset deficits in other subsistence resources, such as grain, when these occurred.

The faunal sample from the 1980–1984 excavations has also added to our understanding of the role of non-mammalian taxa in the subsistence economy. Although waterfowl and tortoises (*Emys orbicularis*) are represented in the 1980–1984 sample to a lesser degree than in the 1976–1979 sample, a significant number of fish bones were recovered during the wet sieving of the fill in features around House 56, particularly Pit 871. The species represented are all small- or medium-sized riverine and lacustrine taxa, including bream (*Abramis brama*), tench (*Tinca tinca*), pike (*Esox lucius*), perch (*Perca fluviatilis*), carp (*Carassius carassius*), roach (*Rutilus rutilus*), ide (*Leuciscus idus*), and pike-perch (*Stizostedion lucioperca*). In addition to the fish bones, deposits of freshwater mussel shells were found in Pits 871 and 899.

Botanical Analysis

Samples of the fill from the features excavated in 1980–1984 were sieved for paleobotanical remains. The only remains recovered with wetsieving came from Pit 892, where a concentration of 785 specimens was recovered. This is one of the largest samples of carbonized grain known for the Lengyel Culture, consisting primarily of *Triticum dicoccum*, emmer wheat (TABLE 2), and was studied by Dr. Krystyna Wasylkowa of the Polish

Academy of Sciences in Kraków. Although all of the grains were heavily carbonized, they were not very deformed, suggesting that the process of carbonization was slow. Many of them have elongated folds in their surfaces, indicating that they had not completely matured. The high proportion of emmer in the botanical sample is consistent with that in the smaller sample of carbonized grain recovered during the 1976–1979 seasons.²⁶

Chronology

One of the goals of the Brześć Kujawski project has been the establishment of a radiocarbon-supported chronology for the Neolithic of the Polish Lowlands. Currently, 20 age determinations are available, performed at laboratories in Łódź, Groningen, and Cambridge (Massachusetts). Most of the dates are from the Radiochemical Laboratory of the Museum of Archaeology and Ethnography in Łódź. The series of dates from Brześć Kujawski and surrounding sites is the largest for any single Neolithic settlement complex in central Europe, and we have been able to date the major occupation phases at Brześć Kujawski with considerable confidence.²⁷

Sixteen of the radiocarbon dates are associated with settlements of the Brześć Kujawski Group of the Lengyel Culture, primarily from Brześć Kujawski itself (TABLE 3).²⁸ The series of dates indicates that the settlements on Sites 3 and 4 were inhabited between ca. 3550 and 3200

26. Bogucki, loc. cit. (in note 19).

27. Additional dates for sites of the Brześć Kujawski Group have been reported by D. Jankowska, A. Koško, K. Siuchninski, and H. Quitta, "Aus den Untersuchungen zur Absoluten Chronologie der Neolithischen Kulturen in Polnischen Tiefland," *ZfA* 13 (1980) 219–240. These dates corroborate the series from Brześć Kujawski and environs.

28. The other sites listed in Table 4, Kuczyna and Gustorzyn, have been excavated in the course of the authors' research at Brześć Kujawski. Gustorzyn is a small Early Lengyel site located 4.5 km NNW of Brześć Kujawski, excavated by R. Grygiel in 1981 (unpublished). Kuczyna is a small special-purpose camp about 4 km west of Brześć Kujawski, excavated by R. Grygiel in 1978; see Grygiel, loc. cit. (in note 14).

25. M. Sobociński, "Materiał kostny zwierzęcy z osad kultury lądzielskiej czarnoziemiu Kujaw zachodnich," *Pomerania Antiqua* 8 (1979) 111–131.

Table 3. Radiocarbon dates for Early Neolithic sites at Brześć Kujawski and vicinity obtained since 1976.

Locality	Site	Feature	Culture	Date b.p.	Date b.c.	Lab. Number
Brześć Kujawski	3	Pit 893	Linear Pottery	6490 ± 450	4540 ± 450	Lod-172
Brześć Kujawski	3	Pit 869	Linear Pottery	6180 ± 35	4230 ± 35	GrN-9255
Brześć Kujawski	3	Pit 825	Linear Pottery	6170 ± 60	4220 ± 60	KN-2996
Gustorzyn	1	Pit 4	Early Lengyel	5740 ± 140	3790 ± 140	Lod-174
Kuczyna	1	Shed	Brześć Kuj. Group	5530 ± 220	3580 ± 220	Lod-93
Brześć Kujawski	3	Pit 775	Brześć Kuj. Group	5525 ± 320	3575 ± 320	GX-6369
Brześć Kujawski	3	Pit 787	Brześć Kuj. Group	5410 ± 340	3460 ± 340	Lod-167
Brześć Kujawski	4	Pit 892	Brześć Kuj. Group	5400 ± 190	3450 ± 190	Lod-193
Brześć Kujawski	3	Pit 782	Brześć Kuj. Group	5370 ± 180	3420 ± 180	Lod-165
Brześć Kujawski	4	House 44	Brześć Kuj. Group	5330 ± 130	3380 ± 130	GrN-8869
Brześć Kujawski	4	House 56	Brześć Kuj. Group	5280 ± 190	3330 ± 190	Lod-194
Brześć Kujawski	4	Pit 899	Brześć Kuj. Group	5280 ± 190	3330 ± 190	Lod-187
Brześć Kujawski	4	Pit 893	Brześć Kuj. Group	5260 ± 190	3310 ± 190	Lod-195
Brześć Kujawski	3	Pit 834	Brześć Kuj. Group	5250 ± 180	3300 ± 180	Lod-173
Brześć Kujawski	3	Pit 775	Brześć Kuj. Group	5210 ± 180	3260 ± 180	Lod-164
Brześć Kujawski	3	Pit 773	Brześć Kuj. Group	5160 ± 180	3210 ± 180	Lod-110
Brześć Kujawski	3	Pit 773	Brześć Kuj. Group	5130 ± 160	3180 ± 160	Lod-163
Brześć Kujawski	3	Pit 816	Brześć Kuj. Group	4930 ± 160	2980 ± 160	Lod-170
Brześć Kujawski	3	Pit 773	Brześć Kuj. Group	4830 ± 160	2880 ± 160	Lod-162
Brześć Kujawski	3	Pit 784	Brześć Kuj. Group	4515 ± 210	2565 ± 210	GX-6370

b.c. The dates which fall between 3300 and 3200 b.c. indicate the probable later terminus of the settlements' development. These dates are corroborated by the patterns of stratigraphic relationships among features and their associated ceramics. Analysis of the ceramics has shown that there are three distinct phases in the development of the ceramic styles of the Brześć Kujawski Group:

- Phase I ca. 3600–3450 b.c.
- Phase II ca. 3450–3300 b.c.
- Phase III ca. 3300–3200 b.c.²⁹

The ceramics associated with House 56 can be dated to Phase II and partly to Phase III. The four radiocarbon dates from features in the House 56 complex conform with this, although the relatively large standard deviations do not permit the establishment of a narrow time-frame for the occupation of the house. The temporal indicators, however, suggest that the major part of the occupation of the structure was during the period 3450–3250 b.c. This corresponds with the maximum development of the Brześć Kujawski settlement as a whole. The entire northern part of the settlement, in which House 56 lies, appears to have been established at this time.

Conclusions

The 1980–1984 excavations at Brześć Kujawski have permitted a better understanding of the internal organi-

zation of a large Neolithic residential site and the detailed study of specific production activities. In particular, this research has focused on household-level organization and activities. This direction in our research was not among the original goals when we began work in 1976, but the interest in internal settlement structure developed as we became more familiar with the archaeological remains at Brześć Kujawski. The data recovered during the 1980–1984 seasons have not markedly changed the conclusions reached after the 1979 season, but rather have filled in more of the emerging picture of Neolithic life on the North European Plain. The augmented series of radiocarbon dates and the larger samples of animal bones and seeds have, in fact, added further support to the chronological sequence and models of subsistence systems which we developed several years ago.

The most important new data recovered during the 1980–1984 seasons bear on household production activities, specifically those dealing with organic materials such as antler, bone, and shell. As a result, we are now able to reconstruct the manufacturing sequences of antler axes and shell beads in some detail. Both of these items are significant elements in Lengyel burials. It has also been possible to establish that there was some degree of household-level specialization, since no other household cluster at Brześć Kujawski has yielded such a large amount of manufacturing scrap from antler and shell working.

The 1980–1984 excavations at Brześć Kujawski have also added to our understanding of the internal organi-

29. Grygiel, loc. cit. (in note 14).

zation of a Neolithic community. The range and variety of features surrounding House 56 are very similar to those found on Site 3 in 1978–79, also associated with a single longhouse of the same period. It can be inferred that these sets of features represent a discrete set of household activities, including craft production and burial. The settlement at Brześć Kujawski has many affinities with other Lengyel settlements of the North European Plain and with other Early Neolithic settlements in central Europe. In the last decade, a number of European archaeologists have taken the position that rather than being treated as undifferentiated communities, these settlements can now be seen as clusters of individual residential units.³⁰ Such a model of Neolithic settlement has significant implications for the process of the Neolithic colonization of temperate Europe, particularly if the primary nexus of decision-making is viewed as the household rather than the settlement as a whole. The model of Neolithic “villages” as the primary adaptive social unit needs to be re-examined if the household is seen as the fundamental unit of production and resource allocation.

As was the case in 1979, the last five years of excavation at Brześć Kujawski have raised as many questions as they have answered. Now that the work at Brześć Kujawski 3 and 4 is essentially complete, at least for the time being, we are turning our attention to several new issues. The first is a further investigation of the nature of Early Neolithic settlement organization, which will involve locating another large Lengyel residential base, although perhaps not on the scale of Brześć Kujawski, and excavating it to explicitly test the results obtained from the work on the House 56 cluster. Another matter that concerns us is the nature of the interaction between the agriculturalists at Brześć Kujawski and the indigenous hunter-gatherer populations of this area. In 1982 and again in 1984, we carried out excavations at a site of the Funnel Beaker Culture (which immediately follows the Late Lengyel Brześć Kujawski Group in this area) at Nowy Młyn, about 5 km north of Brześć Kujawski. The Funnel Beaker Culture appears to be derived from the indigenous hunter-gatherer groups of the North European Plain, and how and why these groups adopted agriculture and stockbreeding is a question that has not been adequately answered. We hope that the rich archaeological resources of the Brześć Kujawski region will enable us to address these questions more fully.

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30. For example, J. Lüning, “Siedlung und Siedlungslandschaft in bandkeramischer und Rössener Zeit,” *Offa* 39 (1982) 9–33.