



## Tactical and Strategic Settlements in the Early Neolithic of Lowland Poland

Peter I. Bogucki

*Journal of Anthropological Research*, Vol. 35, No. 2. (Summer, 1979), pp. 238-246.

Stable URL:

<http://links.jstor.org/sici?sici=0091-7710%28197922%2935%3A2%3C238%3ATASSIT%3E2.0.CO%3B2-C>

*Journal of Anthropological Research* is currently published by University of New Mexico.

---

Your use of the JSTOR archive indicates your acceptance of JSTOR's Terms and Conditions of Use, available at <http://www.jstor.org/about/terms.html>. JSTOR's Terms and Conditions of Use provides, in part, that unless you have obtained prior permission, you may not download an entire issue of a journal or multiple copies of articles, and you may use content in the JSTOR archive only for your personal, non-commercial use.

Please contact the publisher regarding any further use of this work. Publisher contact information may be obtained at <http://www.jstor.org/journals/unm.html>.

Each copy of any part of a JSTOR transmission must contain the same copyright notice that appears on the screen or printed page of such transmission.

---

JSTOR is an independent not-for-profit organization dedicated to and preserving a digital archive of scholarly journals. For more information regarding JSTOR, please contact [support@jstor.org](mailto:support@jstor.org).

## TACTICAL AND STRATEGIC SETTLEMENTS IN THE EARLY NEOLITHIC OF LOWLAND POLAND

Peter I. Bogucki

Department of Anthropology, Harvard University, Cambridge, MA 02138

*Attempts to correlate the earliest Neolithic sites in lowland Poland with various soil types and Topographic features have been generally unsuccessful, due primarily to the quite diverse character of the soil cover and subtle physiography in this area. In this paper, a model of "tactical" and "strategic" sites is developed, based on Clay's (1976) model to account for the diversity of Mississippian sites in the midcontinental United States. The argument is presented that this very diversity of site locations, coupled with a uniformity of site size, is an important aspect of the initial settlement of new territory.*

A NUMBER OF ATTEMPTS to seek regularities in the settlement locations of the earliest farming populations in central Europe have appeared in recent years (Quitta 1970; Wiślański 1966, 1969; Kruk 1973; Sielmann 1971, 1972, 1976). These have tended to emphasize the associations of Bandkeramik (a.k.a. Linear Pottery, Danubian I) and later sites with particular soil types, especially the loess belt which stretches across Europe from Slovakia to the North Sea. Although these studies have been important contributions to our knowledge of early Neolithic settlement in central Europe, their concentration on soil type as a determinant of settlement location has had several effects which are a potential hinderance to future work. First of all, in areas on or near the loess belt, the very high (although not at all complete) correlation of Bandkeramik and later "Danubian" sites with this particular soil has tended to blind researchers to the possibility that there may be other factors operating to determine the location of Neolithic settlement *within* the loess zone, such as political or economic (other than subsistence) considerations. Secondly, in areas of intensive Bandkeramik and later "Danubian" settlement not on loess, such as the Kujavia area of central Poland and the Pyrzyce-Anger münde-Prenzlau area near the mouth of the Odra river in western Pomerania, attempts to correlate early Neolithic settlement with soils have been, in my opinion, relatively unsuccessful. Wiślański, the primary researcher on the early Neolithic in this area, has noted (1969:71) that early Neolithic sites tend to be found near the borders of ecological units and near areas of "fertile" soils. These are important observations, but they really do not tell us much. In lowland Europe, the very diversity of the glacially-deposited soils and the number of lakes and bogs which dot the landscape make it very difficult to find a location *not* on the border of two ecological zones. The correlation of Neolithic settlement with "fertile" soils is not particularly informative beyond a certain point, since, as with the correlation of settlement with the loess further south, it tends to make researchers believe that only subsistence factors were responsible for the location of settlement even within these areas of fertile soils.

It is possible to examine this early Neolithic settlement in central Europe and the changes in it over time from a different perspective. R. Berle Clay (1976), looking at Mississippian sites in the mid-South of the United States, was faced with a situation much like the one which we encounter in lowland Europe, where single variables like soil type or topography are not particularly informative about preferred settlement locations. I feel

that his approach to the problem has merit and propose to apply it to the area of early Neolithic settlement in central Europe which I know best, the Kujavia and Wielkopolska region northwest of Warsaw in central Poland.

#### SYSTEM ENVIRONMENTS

Clay draws on the work of Emery and Trist (1965) who define a typology of what they call "system environments" within which organizational systems operate. These types summarize and relate the characteristics of the environment (in a broader sense than that used by writers like J.G.D. Clark in that it includes not only the physical surroundings but also other organizational systems operating in the same area), the perceptions of this environment by the organizational system, and the response of the system to it. (It should be noted that Emery and Trist's original study does not deal with traditional societies usually studied by anthropologists but rather with American corporations and British trade unions. However, I do not feel that concepts expressed in it are confined to modern Euro-American society.)

Of the four "system environments" defined by Emery and Trist, two are relevant to this study. The most elementary environment type is one to which Emery and Trist refer as "placid-randomized." In this environment, which is that encountered by an organizational system in novel surroundings, the "goods and bads" (such as suitable farm lands, good defensive positions, communication routes, grazing land, ranges of exploited species of wild animals, and the like) are effectively randomly distributed in space because the system has not yet had the opportunity to map enough of the relevant variability in the world around it. The system entering such an environment is not completely certain of just where the optimal locations are. As a result, it responds *tactically* to this type of environment: "it does its best on a local level," to use Emery and Trist's words. There is a shifting relationship between the community and its surroundings as the group becomes increasingly familiar with the resources and other variables in the world around it.

The second Emery and Trist environmental type which is germane to our study is one which they call "placid-clustered." Here, the goods and bads are clustered in space or at least their locations are sufficiently mapped by social groups becoming increasingly familiar with the regional variability. These groups respond *strategically* to this sort of system environment by locating their centers of activity cognizant of the optimal areas on a regional scale. This allows them to exercise some degree of planning and foresight in their site location rather than simply trying to make the best of local situations.

The other two system environments defined by Emery and Trist will not be discussed here (even though Clay, in fact, has made use of one of them). But confining myself to the first two Emery and Trist environments, I find that Clay's predictions of the formal characteristics of Mississippian sites responding to these environments quite applicable to my Polish study area. Settlements in a placid-randomized environment can be expected to be of relatively uniform size and duration (generally short) with a low density of sites in the region as a whole and a relatively rapid use-abandonment-reuse of the site area. The settlements in a placid-clustered environment, on the other hand, should be of longer duration, exhibiting the greater investment, of labor in a particular location and continued rebuilding (not just reoccupation) on the site over time. They should be located in areas accessible to nodes of interregional communication networks (such as rivers) and a general diversity of site sizes and (possibly) functions.

The most attractive thing about the Emery and Trist system environments is that they take into consideration the perceptions of the environment held by the organizational system. With the spread of the Bandkeramik food-producing population into central Europe, we have one of the few documentable population expansions in prehistory (Tringham 1968, 1971:73). Studies of perceptions of *terrae incognitae* indicate that the images held by the penetrating population may be based on beliefs about the nature and content of the land which are far removed from reality (Wright 1947). Not only are there differences in the processes of image-formation about unknown areas but also such perceptions can become further divorced from reality in the course of their transmission from person to person or from group to group (Lewis 1975:23-41). The Great Plains of North America, for instance, were perceived by the earliest Euro-americans to penetrate them to be anything from lush, fertile grasslands to barren wastes (Allen 1975:3-11). If such a variety of perceptions of resource location prevailed, then it would not be particularly informative to look for regularities in settlement location during the Bandkeramik penetration of lowland Europe.

#### TACTICAL AND STRATEGIC SITES IN LOWLAND POLAND

In the Polish study area examined in this paper, the earliest traces of Bandkeramik settlement occur in the late fifth millennium B.C. (supported by a sole radiocarbon date from Strzelce of  $4310 \pm 60$  BC: GrN-5087). The subsequent culture history of the next millennium is not as yet well supported by radiocarbon dates, but it sees the occupation of this area by the Lengyel culture which begins around 3800/3700 BC and continues to about 3200/3100 BC, divided into several periods. A model widely used by Polish archaeologists (e.g. Jażdżewski 1965) treats these phases of settlement as representing new migrations of colonists from the area of the middle Danube, up through the Moravian Gate, and north along the major river valleys onto the North European Plain. I do not feel that there is any evidence to support this model of continued influx of new peoples after the initial Neolithic settlement of the area. Kamienska (1969:207-218) has shown the local continuities of the Bandkeramik-Lengyel sequence in Małopolska (near Kraków), and a recent article by Koško and Bednarczyk (1973:9-26) makes similar observations on the lowland material. The fact that a number of local variants of Lengyel pottery assemblages can be recognized (Kamienska and Kozłowski 1970) strongly suggests that major population movements were not taking place. In this paper, the terms "Bandkeramik" and "Lengyel" will not be used to distinguish populations akin to ethnic groups, but rather as chronological units defined by changes in ceramic assemblages.

Researchers dealing with the Banderamik settlement of this area have attempted to divide the known sites into two categories, which can be very generally characterized as large, extensive sites and small, short-term ones (Wiślański 1966, 1969). There are no consistent differences in the ceramic inventories between the two varieties and in both types pits of varying shapes and sizes are the primary feature. I would argue that this dichotomy is not borne out in the archaeological evidence. First of all, no traces of structures have been recognized on any of the sites, even the larger ones (Soudský's 1969 suggestion that there may be Bandkeramik post-construction longhouses at Brześć Kujawski 4 notwithstanding), suggesting that the durations of occupation of sites called "large" Bandkeramik sites are contemporary and the product of the same occupation

episode. Moreover, the dichotomy between these two classes of sites is exaggerated by differences in the sizes of areas excavated by archaeologists.

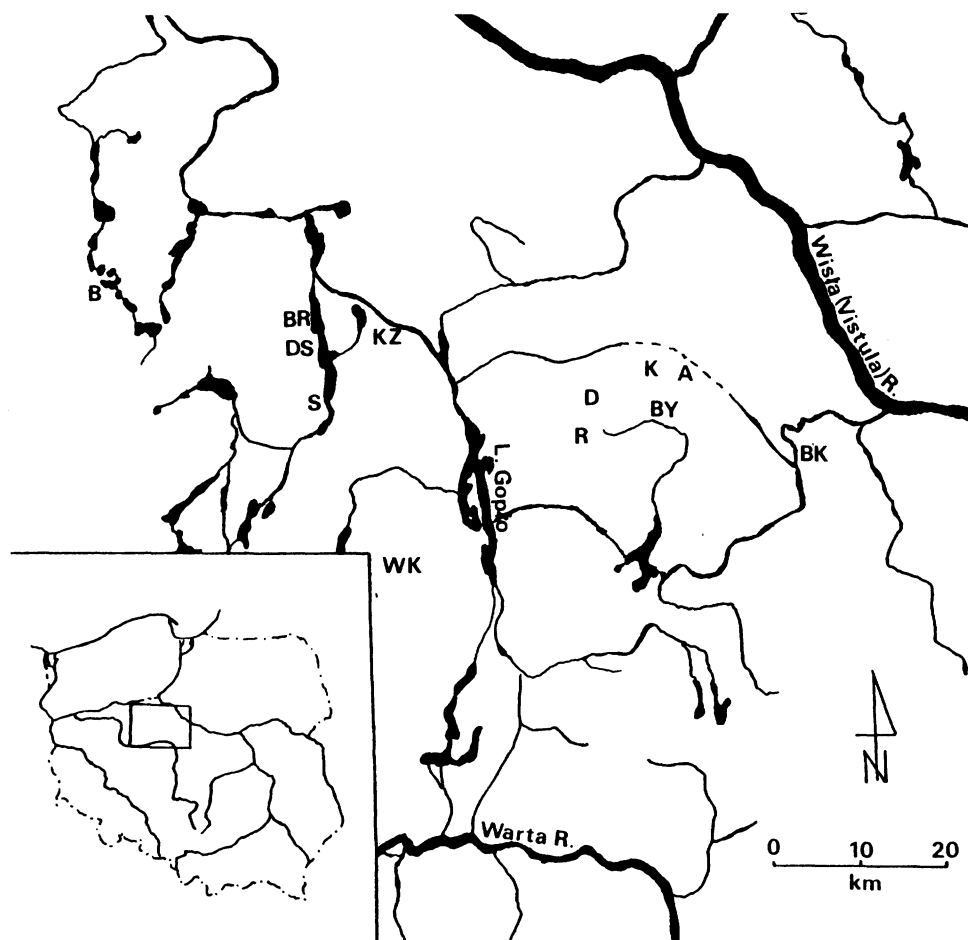


Figure 1. Kujavia and Wielkopolska regions of Poland (inset) with locations of sites mentioned in text: A—Adolfin; B—Biskupin 15a; BK—Brześć Kujawski; BR—Broniewice; BY—Byczyna; D—Dobre; DS—Dobiesiewice; K—Krzywosadz; KZ—Krusza Zamkowa; R—Radziejów; S—Strzelce; WK—Wola Kozuszkowa.

An examination of the evidence indicates instead that the Bandkeramik settlements in lowland Poland consist uniformly of several pits, some of which have dense concentrations of potsherds, flint debitage, and faunal remains. At Brześć Kujawski 4, for instance, the Bandkeramik settlement (considered by Wiślański to be a large one) left just five pits in addition to some material in the mixed cultural layer (Grygiel 1976). Admittedly, this site has seen much later occupation which did not contribute at all to the preservation of the earlier features. Still, I would not consider it to be markedly larger than sites like Wola Kozuszkowa (Grygiel 1975), Strzelce (Wiślański 1959) or the complex of sites near Radziejów (Gabałówna 1963). In addition, there are a number of uniformly small sites

scattered across the area, most of which are known only from surface finds although some (like Adolfin near Aleksandrów Kujawski and Byczyna near Radziejów) have been excavated (Grygiel 1976:96-8). The picture begins to emerge of a number of small, undifferentiated temporary settlements scattered across the landscape of lowland Poland.

These can be viewed as the tactical responses of Bandkeramik settlers entering an environment quite different from the loess belt of central Europe, doing their best on a local level while in the process of mapping out the variability in the lowland environment. These sites are found in a variety of locations: at Brześć, on the top of a slight rise in the ground moraine next to a glacial kettle-lake; at Krzywosądz (Komorowski 1959), on top of a large dune. At Radziejów, a series of Banderamik sites is located along the base and lower slopes of a large moraine (a distribution markedly different from the later Funnel Beaker Culture sites in the area, all of which are located on top of the moraine). Wiślański's observation (1969:63) that the Bandkeramik sites occur on the boundaries of different soil types may be quite significant since the desire to maximize imperfectly known resources (and minimize short-term risks) over a short period of time would make such diverse areas attractive. In some cases, it is possible that short-lived features of the landscape such as forest clearings accounted for the location of Bandkeramik sites. The relatively long duration of this tactical response to an incompletely-mapped environment (perhaps 500 years) is very possibly due to the low overall population density of the Bandkeramik settlers and the resultant low degree of information exchange about the location of significant environment variables.

What motivated the Bandkeramik penetration of lowland Europe? Many authors might simply invoke the hypothesis that due to the depletion of the fertility of the loess soils to the south, the Bandkeramik agriculturalists were forced to seek fertile land further afield in order to maintain a growing population. I have argued elsewhere (Bogucki n.d.) against the validity of such carrying capacity hypotheses in connection with the Banderamik expansion, contending that the loess soils were not occupied to their capacity and that new evidence from the Rhineland (Kuper et. al. 1974) suggests that Banderamik sites were occupied for quite a long period of time. Rather than representing the overspill of the Bandkeramik population from the loess, I would suggest that these tactical sites are those of groups interested in finding and developing resources other than arable land. Sherratt (1977:561-2) has recently called attention to the fact that while Bandkeramik settlement is indeed concentrated on the fertile loess soils of central Europe, many important nonorganic raw materials, such as tool-grade flint and amphibolite, could be found only at great distances from these soils. I would argue that the motivation to find sources of such materials provided the impetus for this first push out onto the North European Plain by food-producing groups.

This picture of small, undifferentiated sites changes by the middle of the fourth millennium B.C., by which time we are dealing with the Lengyel culture-historical unit. The tendency for the Lengyel settlements to be located on the boundaries of different soil zones like their Banderamik predecessors has been noted by Wiślański (1969:71), as well as their concentration in the same regions as the Bandkeramik sites when lowland Poland is viewed as a whole. However, there is a much richer hierarchy of settlement sizes at this time and the first evidence in the lowland for long-term structures, the well-known trapezoidal Lengyel longhouses (Jażdżewski 1938, Gabałówna 1966 among others), which range from 15-40 meters in length.

Small, probably short-term sites superficially similar to those observed in the Bandkeramik occupation of this area still occur, although often they are not deliberately sought by excavators and instead appear as chance finds in road cuts or found stratified under sites of later periods. Two such sites with which I am familiar both occur within two kilometers of the town of Brześć Kujawski (Falborz 1: *Informator* 1976, and Karpaty 1: unpublished excavations in 1977 of the Łódź Museum). Both of these appear to have shorter and less intense periods of occupation than the short-term Bandkeramik sites, generally with much less cultural debris and smaller and more-scattered pits. I will return to the topic of these short-term Lengyel sites below.

The two other size-grades of Lengyel sites in lowland Poland are both characterized by trapezoidal longhouses. The first of these has one or two trapezoidal houses with no traces of others nearby and no superimposed structures indicating rebuilding episodes. Many examples of such sites are known, among them Dobre (near Radziejów) site 6 (Jażdżewski 1938), Biskupin 15a (Maciejewski 1956), Dobiesiewice 2 (Bednarczyk and Koško 1975), and Broniewice 4 (*Informator* 1971). Typically, a single longhouse is found on these sites (two in the case of Dobre) along with several trash pits and possibly some graves (notably at Biskupin 15a and Broniewice 4). The discovery of only isolated houses does not appear to have been the product of limited areas of excavation.

Finally, there are the large Lengyel sites with many trapezoidal longhouses existing simultaneously and with a long period of occupation indicated by frequent rebuildings and superimposed structures. Two of these are currently known from lowland Poland. One is the large, multi-period site currently being excavated by the Adam Mickiewicz University (Poznań) at Krusza Zamkowa near Inowrocław (*Informator* 1974, 1975, 1976 and personal communication of Drs. A Koško and J. Bednarczyk). The other is site 4 at Brześć Kujawski (Jażdżewski 1938, Gabałówna 1966, and current excavations of Mgr. R. Grygiel and the author). Since Krusza Zamkowa is still under excavation, the information on it is still rather sketchy, but it appears that the traces of about a dozen trapezoidal houses have been exposed, although I do not know whether or not they existed contemporaneously or partially in sequence. Brześć Kujawski 4 has been well-known to European archaeologists since before World War II on the basis of Dr. Konrad Jażdżewski's excavations there in 1933-39. Here, the complete or partial remains of over 50 longhouses have been exposed. In detailed analysis of the stratigraphic relationships of these structures, Gabałówna (1966) has recognized seven periods of construction activity on the site and concludes that at any one time there were about half-a-dozen "active" longhouses in existence. This is an analogous situation to some of the larger Bandkeramik loess settlements, such as Byłany (Soudský and Pavlu 1972:319), except that the settlement at Brześć Kujawski 4 is several hundred years later. Large numbers of Lengyel graves occur at both Krusza Zamkowa and Brześć Kujawski 4, and some of these are impressively furnished (Jażdżewski 1938, Czerniak 1977).

The long-term Lengyel sites represent strategic responses to the increasingly better-investigated lowland environment. Not only do they represent longer commitments to a single location but there is a tendency of these sites to be located at nodal points in the waterways of the lowlands. The settlement at Brześć Kujawski is situated not far from a bend in the Zgłowiączka river where it joins the Bachorza river. The combination of this nodal location and the fertile Kujavian black earth in the vicinity was probably a major contributing factor to the continuity of settlement on this site. Krusza Zamkowa, mean-

while, is located between the tip of Lake Gopło and Lake Pakość, the two longest and largest of the Kujavian glacial lakes, on the river connecting them. Nearby is another patch of fertile Kujavian agricultural land and the opportunity for salt extraction in the Inowrocław (German *Hohensalza*) area. Lengyel features which have been interpreted as pans for the evaporation of brine from salt springs have been found in the Kraków area (Jodłowski 1971, 1976:151). Should this be a correct assessment, then it would appear that some effort was being put into salt extraction in fourth millennium B.C. Europe. The smaller settlements with the single or double longhouses cannot be fitted into a regular pattern topographically, but the commitment to a single location for at least the use-life of the house would indicate that at least some preplanning went into the choice of a site location. However, the lack of rebuilding episodes on these sites suggests that either some drawbacks were discovered in the location of the site or that some ephemeral quality of the location which made it originally attractive had disappeared. The use-life of one of these structures is a matter of some dispute. Jazdzewski (1938) estimated it at 50 years, whereas Gabałówna (1966, 1968) argues for the more conservative figure of 20 years. Kuper (Kuper et al. 1974), dealing with Bandkeramik structures in the Rhineland, notes that his inquiries of people knowledgeable about post structures indicate a use-life of 20-30 years, although he moves it up to 35 years later in the same article. Even if we were to know the use-life of one of these structures, there is always the possibility that it was abandoned shortly after construction. The most that we can say is that the sites with one or two longhouses do not exhibit the duration of occupation seen on sites like Brześć Kujawski 4.

The short-term Lengyel sites mentioned above are not difficult to fit into such an organizational model. In my opinion, they differ from the Bandkeramik tactical settlements. Whereas the Bandkeramik sites have trashpits filled with large quantities of animal bones and flint debitage, the pits on these short-term Lengyel sites are very poor in artifactual content and faunal material (judging from the two in the immediate vicinity of Brześć Kujawski mentioned above) and instead contain just a small amount of ceramic material. Animal bones are confined (at least at Karpaty 1, with which I have first-hand experience) to small splinters. Whereas the Bandkeramik sites suggest self-sufficient units participating in many aspects of economic activity, the short-term Lengyel sites could be argued to represent specialized stations operated by the larger sites for a single purpose, such as maintaining outlying agricultural plots or supervising herds of animals.

It can be argued that similar tactical/strategic schemes can be developed in other parts of early Neolithic central Europe. For instance, on the loess uplands of southern Poland, there is a noticeable lack of large Bandkeramik sites with typologically-early ceramics. Sites like Zofipole (Kulczycka 1961) and Samborzec (Kamińska 1964) consist only of small groups of trash pits with dense concentrations of artifactual material, much like Strzelce and the Bandkeramik features at Brześć Kujawski in the north. It is only during the middle and late (late Notenkopf/Zeliezovce) phases of the Bandkeramik occupation that large, long-term (arguably "strategic") settlements such as Olszanica (Milisauskas 1976) appear. The timelag between the initial appearance of "tactical" settlements and the development of "strategic" sites in southern Poland is only slightly shorter than that observed in the north, since in lowland Poland the earliest Bandkeramik sites can be typologically correlated with the middle and late Bandkeramik phases in the south.



## CONCLUSION

The above discussion of tactical and strategic sites gives some structure to the early Neolithic settlement of lowland Poland where previous single-factor attempts at explaining the location of sites were found lacking. In doing so, it calls attention to the fact that a prehistoric population entering new territory should *not* necessarily be expected to locate its settlements in any sort of regular relationship to variables like topography or soils. (In fact, if it were to do so, then some interesting organizational processes were probably at work, such as the *locator* system used by the medieval Germans in their colonization of the eastern Slavic lands.) Rather, the colonizing population should be expected to locate its settlements in a variety of situations by virtue of the fact that it will take time to become fully acquainted with the area. As such, diversity of settlement location may tell us as much as any sort of regularity. Research designs developed to study such prehistoric situations should pay as much attention to the later adaptations to a completely-mapped environment as they do to the tactical adaptations of the initial colonizers.

## REFERENCES CITED

- Informator = Informator Archeologiczny, 1971, Badania 1970r. Warszawa.  
 1974, Badania 1973r. Warszawa.  
 1975, Badania 1974r. Warszawa.  
 1976, Badania 1975r. Warszawa.
- Allen, J.L., 1975, Exploration and the creation of geographical images of the Great Plains. Pp. 3-20 in *Images of the Plains: the role of human nature in settlement* (ed. by B.L. Blouet and M.P. Lawson). Lincoln: University of Nebraska Press.
- Bednarczyk, J. and A. Koško, 1975, Badania archeologiczne na Stanowisko 2 w Dobiesiewiczach, pow. Mogilno. *Sprawozdania Archeologiczne* 27:197-226.
- Bogucki, P., n.d., Carrying capacity models and the early Neolithic of central Europe. Paper read at symposium "Old World Prehistory: current developments in theory and method," Northeastern Anthropological Association annual meeting, March 17-19, 1978, Quebec, P.Q.
- Clay, R.B., 1976, Tactics, strategy and operations: the Mississippian system responds to its environment. *Midcontinental Journal of Archaeology* 1:137-62.
- Czerniak, L., 1977, Krusza Zamkowa 3, tombe n° 155. Pp. 240-46 in *Inventaria Archaeologica: Pologne* 34 (ed. by L. Czerniak, R. Grygiel, and W. Tetzlaff).
- Emery, F.E. and E.L. Trist, 1965, The causal texture of organizational environments. *Human Relations* 18:21-32.
- Gabałówna, L., 1963, Ślady osadnictwa kultur z cyklu wstęgowych w Radziejowie Kujawskim. *Prace i Materiały Muzeum Archeologicznego i Etnograficznego w Łodzi* 9:25-91. (archeological series)
- Gabałówna, L., 1966, Ze Studiów nad Grupą Brzesko-kujawską Kultury Lendzielskiej. *Acta Archaeologica Lodziensia* 14.
- Gabałówna, L., 1968, W sprawie czasu trwania osad neolitycznych. Pp. 31-36 in *Na Granicach Archeologii Łódź*: (Jażdżewski festschrift).
- Grygiel, R., 1975, Osada kultury ceramiki wstęgowej rytej w Woli Kozuszkowej, woj. Bydgoszcz (stan. 1). *Fontes Archaeologici Poznaniensis* 25:60-67.
- Grygiel, R., 1976, Osady kultury ceramiki wstęgowej rytej w Brzesciu Kujawskim koło Włocławka. *Prace i Materiały Muzeum Archeologicznego i Etnograficznego w Łodzi* 23:5-114. (archaeological series)

- Jażdżewski, K., 1938, Cmentarzyska kultury ceramiki wstęgowej i związane z nimi ślady osadnictwa w Brzesciu Kujawskim. *Wiadomości Archeologiczne* 15:1-105.
- Jażdżewski, K., 1965, Poland. New York: Praeger.
- Jodłowski, A., 1971, Eksploatacja soli na terenie Małopolski w pradziejach i we wczesnym średniowieczu. *Studia i Materiały do Dziejów Żup Solnych w Polsce* 4.
- Jodłowski, A., 1976, Technika produkcji soli na terenie Europy w pradziejach i we wczesnym średniowieczu. *Studia i Materiały do Dziejów Żup Solnych w Polsce* 5.
- Kamińska, J., 1964, Osady kultur wstęgowych w Samborcu, pow. Sandomierz. Pp. 77-190 in *Studia i Materiały do Badań nad Neolitem Małopolski*. (ed. by S. Nosek). Wrocław: Ossolineum.
- Kamińska, J., 1969, Frühe Entwicklungsphase der Lengyel-kultur in Kleinpolen. *Studijne Zvesti* 17:207-18.
- Kamińska, J. and J. Kozłowski, 1970, The Lengyel and Tisza cultures. Pp. 76-143 in *The Neolithic in Poland* (ed. by T. Wiślański). Wrocław: Ossolineum.
- Komorowski, P., 1959, Osada wydmowa kultury wstęgowej ceramiki rytej w miejsc. Krzywosądz, pow. Nieszawa. *Wiadomości Archeologiczne* 26: 56-59.
- Koško, A. and J. Bednarczyk, 1973, Relacje chronologiczne między kulturami cyklu wstęgowego a kulturą pucharów lejkatych na terenie Polski północno-zachodniej. *Pomerania Antiqua* 5:9-26.
- Kruk, J., 1973, *Studia Osadnicze nad Neolitem Wyżyn Lessowych*. Wrocław: Ossolineum.
- Kulczycka, A., 1961, *Materiały kultury starszej ceramiki wstęgowej z Zofipola, pow. Proszowice*. *Materiały Archeologiczne* 3:19-26.
- Kuper, R. H. Löhr, J. Lüning, and P. Stehli, 1974, Untersuchungen zur Neolithischen Besiedlung der aldenhovener Platte IV. *Bonner Jahrbucher* 1974:424-508.
- Lewis, G. M., 1975, The recognition and delimitation of the northern interior grasslands during the eighteenth century. Pp. 23-44 in *Images of the Plains: the role of human nature in settlement* (ed. by B. Blouet and M. Lawson). Lincoln: University of Nebraska Press.
- Maciejewski, F., 1956, Budowla trapezowata kultury nadcisanijskiej z Biskupina. *Sprawozdania Archeologiczne* 2:26-33.
- Milisauskas, S., 1976, *Archaeological Investigations on the Linear Culture Village of Olszanica*. Wrocław: Ossolineum.
- Quitta, H., 1970, Zur Lage und Verbreitung der Bandkeramischen Siedlungen in Leipziger Land. *Zeitschrift für Archäologie* 4:155-76.
- Sherratt, A., 1977, Resources, technology, and trade: an essay in early European metallurgy. Pp. 557-81 in *Problems in Social and Economic Archaeology* (ed. by G. de G. Sieveking) (Clark festschrift).
- Sielmann, B., 1971, Zum verhältnis von Ackerbau und Viehzucht im Neolithikum Südwestdeutschlands. *Archeologisches Korrespondenzblatt* 1: 65-68.
- Sielmann, B., 1972, Die frühneolithische Besiedlung Mitteleuropas. Pp. 1-65 in *Die Anfänge des Neolithikums vom Orient bis Nordeuropas Va*. (ed. by H. Schwabedissen). Köln-Graz: Böhlau.
- Sielmann, B., 1976, Der Einfluss der geographischen Umwelt auf die linien- und stichbandkeramischen Bediedlung des Mittelbe-Saale-Gebietes. *Jahreschrift für Mitteldeutschen Vorgeschichte* 60: 305-29.
- Soudský, B., 1969, Etude de la maison neolitique. *Slovenska Archeologia* 17:1-96.
- Soudský, B. and I. Pavlů, 1972, The Linear Pottery Culture settlement patterns of central Europe. Pp. 317-27 in *Man, Settlement, and Urbanism* (ed. by P. Ucko, R. Tringham, and G.W. Dimbleby). London: Duckworth.
- Tringham, R., 1968, A preliminary study of the early Neolithic and latest Mesolithic blade industries in southeast and central Europe. Pp. 45-70 in *Studies in Ancient Europe*. (ed. by J. Coles and D.D.A. Simpson). Leicester.
- Tringham, R., 1971, *Hunters, Fishers and Farmers of Eastern Europe 6000-3000 B.C.* London: Hutchinson.
- Wiślański, T., 1959, Wyniki prac wykopaliskowych w Strzelcach w pow. mogileńskim. *Fontes Archeologici Posnaniensis* 10:1-96.
- Wiślański, T., 1966, Próba zarysowania podstawowych form osadnictwa neolitycznego w Polsce północno-zachodniej. *Archaeologia Polski* 10:474-505.
- Wiślański, T., 1969, *Podstawy Gospodarcze Plemion Neolitycznych w Polsce Północno-Zachodniej*. Wrocław: Ossolineum.
- Wright, J.K., 1947, *Terrae incognitae: the place of the imagination in geography*. *Annals of the Association of American Geographers* 37:1-15.