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DOBKOWICE REVISITED. INTERDISCIPLINARY RESEARCH ON AN ENCLOSURE OF THE JORDANÓW CULTURE

ABSTRACT: The site near Dobkowice (Lower Silesia) was discovered by accident in 1971. Archaeological excavations carried out in 1972 and 1979 to 1981 have revealed 16 features; among them various kinds of pits, the remains of a ditch, and 4 burials related to the Jordanów culture. In 2012, interdisciplinary investigations were performed on site. The main research goals were the confirmation of the existence of an enclosure, a re-evaluation of the absolute chronology of the site (by radiocarbon dating) and obtaining sample material for laboratory analyses: archaeobotanical, geoarchaeological (e.g. soil/sediment micromorphology) and osteological. In order to ensure a solid research framework a three-step procedure has been adopted: 1) geophysical prospection with a magnetometer, which revealed a number of anomalies indicating the presence of archaeological features, including a double ditched enclosure; 2) excavations in designated areas, which confirmed the presence of ditches and their chronological association with the Jordanów culture; revealed a burial in one of the ditch sections and enabled the collection of sample material; 3) laboratory analyses (currently in progress): archaeobotanical, geoarchaeological, osteological, DNA and stable isotope analyses of the discovered human remains and radiocarbon dating. Such an approach to site investigation permits the examination of the archaeological record (also on the microscopic scale) and acquisition of new data, while doing limited damage to the archaeological substance. The chosen analytical techniques will hopefully deliver new information, which will enable a better understanding of chronology, land use patterns, and the function of enclosures in Neolithic Lower Silesia. The aim of this paper is to present this procedure "in action" and discuss the preliminary research results.

KEY WORDS: Jordanów culture – Neolithic – Enclosure – Silesia

INTRODUCTION

The Jordanów culture can be considered one of the most interesting cultural phenomena of the Central European

Neolithic. The history of research on this particular taxonomic unit, its defining and interpretation, is also a good example illustrating the complex relations between archaeological data and the theoretical

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foundations of archaeology as a science. As of today, the understanding of this cultural entity is diverse and there is hardly any consensus on many, often basic issues (Novotný 1950).

The name Jordanów culture was introduced by H. Seger following his research in Jordanów Śląski (Lower Silesia) in the years 1898–1906 and 1911. During these rescue excavations connected with railway construction, numerous Neolithic settlement features and burials were discovered. Part of the archaeological material had been assigned to the newly coined term: "Jordanów Type" (Jordansmühler Typ), which later became known as the Jordanów culture. Its basic typological characteristics recognised by H. Seger included stylistic features of pottery, especially the specific jug form, with its distinct morphology and decoration; and the presence of copper artefacts in graves (Seger 1906, 1916). The dispute on issues of genesis, chronology, territorial extent and many others is still ongoing (Buschendorf 1951, Kazdová et al. 1994, Kulczycka-Leciejewiczowa 1979, Lüning 1976, Novotný 1950, Vávra 1989, Wojciechowski 1966). Unfortunately, the lack of a complete analysis of many crucial finds, including the eponymous site in Jordanów Ślaski seriously hampers this debate.

The discussion often raises the issues of terminology and taxonomy, focusing mainly around the dilemma: Jordanów group or Jordanów culture? Our use of the term "archaeological culture" is in archaeometric terms, as a tool for ordering and systematising of the archaeological record. At the same time, we accept a polythetic model of distinguishing "cultures" and do not consider them objective beings, determined "once and for all" (Czerniak 1996, 2000).

Despite a growing number of available radiocarbon dates, the Silesian Neolithic chronological sequence still requires further investigation. It seems that the dynamic of cultural development was not uniform, but varied in different parts of Silesia. Beside regions of long-term and intensive settlement by farming communities, mostly characterised by environmental conditions suitable for the functioning of the economy of these groups, there were areas of less favourable conditions, where hunter gatherer communities most likely existed for a longer time. The onset of the Neolithic in Silesia is marked by the appearance of the Linear Pottery Culture (ca. 5500–5000 BC). Throughout the 5th millennium BC the Danubian cultural model was continued by post-linear groups, most often of a syncretic character, which combined certain elements of the Stroke Pottery Culture, Lengyel Culture, Tisza, Tiszapolgár, and Bodrogkeresztúr (e.g. Janák 2007, Kadrow 2009, Kulczycka-Leciejewiczowa 2000, 2004). The Jordanów culture, which can be roughly dated to the second half of the 5th millennium BC and the beginning of the 4th millennium BC, forms the latest stage of the cultural-chronological sequence of these post-linear communities in western Silesia (*Figure 1*).

A concentration of archaeological sites assigned to the Jordanów culture is situated just south of Wrocław (Lower Silesia), in the basins of the rivers Bystrzyca, Oława and Ślęza, between the Sudety Mountains to the south, and the Odra valley to the north. Favourable environmental conditions facilitated the development of a settlement network of Neolithic farming communities in this region, starting from the mid-6th millennium BC. At present about 20 Jordanów culture sites are known, the majority of which were discovered before 1945. Mainly, these are purely sepulchral sites, however burials are also known from settlements (Figure 2). Unfortunately, the current state of research does not permit any inferences regarding the functional and/or chronological relation between these two types of Jordanów culture sites. In the post-1945 period several locations were broadly investigated. Especially worth mentioning is the site at Tyniec Mały, where research conducted in the 1970s led to the uncovering of 54 features of various form, including pits, post holes, burials and elongated pits - possibly remnants of a ditch (or ditches) (Noworyta 1986). Alas, neither a reconstruction of the spatial arrangement of these linear features nor an assessment of the full extent of the site are currently available, due to the limited scope of the excavations. Research excavations were also conducted in the 1970s and 1980s at the site near Dobkowice (see below), where elongated pits - ditches and burials were discovered, possibly suggesting a site of very similar character to Tyniec Mały (Czarniak 2011).

Further discoveries, which deepened the knowledge of the Jordanów culture, were made at Domasław during rescue excavations preceding the construction of the motorway bypass of Wrocław (Mozgała, Murzyński 2012). Here, a cemetery was investigated, with 25 burials containing rich grave goods such as ceramic vessels and artefacts made from bone/antler, copper, stone, flint, and shell. In 2011, another site with possible ditches was uncovered in Wrocław, Krzycka Street (P. Jarysz pers. comm.).

In 2012, upon the commencement of the research programme *Birth of a New World – Neolithic Transformation and Cultural Landscape in Silesia (5500–2000 BC)* (with funding from the National Programme for Development of Humanities), further investigations have been undertaken on the Jordanów culture site at Dobkowice. Research on chosen Neolithic sites in Silesia,



FIGURE 1. Chronological sequence of Neolithic archaeological cultures in Silesia.

which is conducted under the auspices of this programme, implements a specific procedure starting with non-invasive methods (aerial photography and geomagnetic survey), followed by limited scale excavations in areas designated on the basis of the non-intrusive prospection and carried out with the intent of verifying the survey results, exploring the archaeological features and obtaining at the same time various sample material: organic material samples for radiocarbon dating and additional specific sample material for a broad set of other specialist post-ex analyses: anthropological, archaeobotanical, archaeozoological, soil/sediment micromorphology and artefact studies. The aim of this paper is to present this procedure "in action" and discuss the preliminary research results.



FIGURE 2. Distribution of Jordanów culture sites in Silesia: 2, Dobkowice; 11, Tyniec Mały; 16, Wrocław; Krzycka Street. Also marked is the extent and degree of concentration of sites generally related to the Lengyel-Polgar complex.



FIGURE 3. Dobkowice, site 12, Kobierzyce commune, Dolnośląskie Voivodeship. Location of the enclosure and other known archaeological sites: 1, sites generally dated to the Neolithic (most probably post dating the Jordanów culture); 2, sites dated to later periods (Bronze and Iron Age).

Site 12 at Dobkowice is located on the northern slope of a hill, which dominates the landscape in the area, half way between the hills' summit and the river (brook) Sławka. Archaeological sites known both from archive queries, and surface surveys are located along the course of this brook. The majority of these sites represent Bronze Age and Iron Age settlements, however also single fragments of culturally unidentified Neolithic pottery were discovered. Cemeteries dated from the early Bronze Age to medieval times are located on the hills to the north of Sławka. The nearest archaeological site, situated to the west of Dobkowice 12, is a Únětice culture hoard (*Figure 3*).

DOBKOWICE – HISTORY OF RESEARCH

In the autumn of 1971, while extracting sand from a sandpit located at the site, a local farmer discovered a prehistoric burial. It was deposited 0.60 m beneath the present-day surface and contained two ceramic vessels, flint and copper artefacts and a stone hoe. The vessels had disintegrated upon extraction and were discarded. Some of the remaining grave goods: several copper objects, including an axe and ornaments, 13 flint artefacts (11 blades, one blade tool, and one flake) and the stone hoe were secured by the farmer (Lech, Noworyta 1979: Figs. 1–2).

Several months later the finds were donated to the Ślęża Museum in Sobótka. They were identified as belonging to the Jordanów culture. From January to March 1973, the employees of Slęża Museum conducted a survey, both within the sand pits and the surrounding area. Several small test pits were also opened, but besides two flint artefacts and one pottery shard in the ploughsoil no archaeological features were found (Czarniak 2011, Lech, Noworyta 1979). These preliminary surveys were followed by three seasons of excavations conducted on a somewhat larger scale.

During the first season, in 1979, two trenches were opened. The first one (I/79), with an area of 25 m^2 did not yield any finds besides several pottery shards. The

second trench (II/79) had an area of 20 m²; four pits and one posthole were located and excavated within it.

In 1980 two much larger trenches were dug. One of them (I/80, ca. 200 m²) contained four pits; a burial was found in the other (II/80, ca. 70 m²). In 1981 the excavations were concluded by opening one large trench (I/81). It had an area of ca. 230 m² and yielded further finds: six pits and two concentrations of pottery shards. One of the concentrations was interpreted as the remains of a disrupted burial (Czarniak 2011).

Four years later, in 1985, during agricultural work on the field adjacent to the former trenches further artefacts were found. They were interpreted as grave goods from a disturbed Jordanów culture burial.

Altogether, both during the excavations and as a result of accidental discoveries twenty archaeological features have been identified on the site. Four of them were burials, the remaining sixteen – settlement features, including fourteen pits, one posthole and one concentration of pottery shards. All of them were ascribed to the Jordanów culture (Czarniak 2011).

GEOPHYSICAL PROSPECTION

The research project in Dobkowice in 2012 began with a non-invasive geomagnetic survey, conducted with a Bartington Grad 601-2 gradiometer. The prospection was carried out in a zigzag pattern, within an oriented grid of squares 10×10 m, along profile lines 0.5 m apart and with the magnetic gradient value measured every 0.25 m. The terrain covered by the survey extended eastwards and southwards from the inaccessible area of modern sand and gravel extraction pits; it also encompassed areas of earlier archaeological excavations (see above). A total of 15,900 m² were investigated. The geophysical data were processed using DW Consulting ArchaeoSurveyor, v. 2.5.16.0.

The survey recorded a significant number of geomagnetic anomalies, which can be attributed both to human activity of various character, and possibly to the presence of geological formations (*Figure 4A*). In some cases the character of these anomalies: their kind, form and size, allowed for functional interpretations to be proposed, however in most cases, it requires verification through archaeological excavations.

It seems that modern human activity is responsible for the most intensive anomalies recorded (*Figure 4B*). These include some of the small dipole anomalies (caused by lost modern iron items) and further concentrations of anomalies related to the edge of open sand/gravel pits, backfilled extraction pits and the route of an old field track. Other recorded magnetic gradient anomalies appear to be largely connected with prehistoric land use. Among them, of particular prominence is a system of elongated anomalies, which most likely reveal the course of ditches or elongated pits. These possibly can be interpreted as remnants of a vast enclosure with two ditch/elongated pit systems. The full extent of this enclosure remains unknown, as the prospection has not been undertaken in the northern and western areas of the site. In the eastern part, both the "inner" and "outer" linear anomalies follow a curved or slightly curved path. The "outer" linear anomaly in its southern section forms a bulge, similar in shape to an apse, with two symmetrically placed gaps. Further west, a sharp change of orientation at almost a right angle is visible, with the linear magnetic anomaly continuing straight in the SW direction, until turning sharply at ca. 90° once again, this time to the NW. Only a section of the "inner" linear anomaly was identified in the southern part of the site, just slightly curved and pointed NW, somewhat mirroring the course of the "outer" linear anomaly.

Beside linear anomalies, which probably indicate the course of ditches or elongated pits, also identified were a number of circular and oval anomalies, related to other archaeological features. The majority of these are located in the eastern part of the site, in the area between the "inner" and "outer" linear features. Worth attention is the apparent small number or lack of such anomalies/features in western and south-western parts of the site. This may be due to different prehistoric land use practices in these areas, or the occurrence of such archaeological features, that evade recording by geomagnetic methods. The general geomagnetic picture of these parts of the site is distorted by linear anomalies oriented mainly SW-NE, which display values of magnetic field intensity similar to those of the linear archaeological features. These anomalies may be related to specific local geological conditions.

EXCAVATIONS – AIM, METHODOLOGY AND RESULTS

The second step of the research procedure involved archaeological excavations. Based on the geomagnetic survey results, four areas were selected for investigation (Trenches 1/2012, 2/2012, 3/2012, and 4/2012) (*Figure 4A*). The basic criterion governing the designation of these places was the indicated presence of a linear



FIGURE 4. Dobkowice, site 12, Kobierzyce commune, Dolnośląskie Voivodeship. A, results of the geomagnetic prospection (1, 1980–1981 excavations; 2, 2012 excavations); B, interpretation of the geomagnetic prospection results (1, modern sand/gravel extraction pits, damaged area; 2, anomalies related to modern human activity; 3, anomalies related to the course of linear features; 4, anomalies related to the presence of a ditch; 6, extent of geomagnetic prospection).



FIGURE 5. Dobkowice, site 12, Kobierzyce commune, Dolnośląskie Voivodeship. Magnetogramme showing the area of Trench 1/2012, plan of archaeological features discovered in Trench 1/2012 and profiles of chosen features.

feature. The trenches were marked out within the coordinates of the site grid, which had been set for the geophysical prospection. The total excavated area was 162 m² and the research goals were as follows: 1) verification of magnetometer survey results; 2) detailed investigation of archaeological features, their internal stratification and relations with one another; and 3) collection of sample material for a set of post-ex analyses.

Trench 1/2012 (68 m²) was marked out with the intention of exploring a section of the "inner" enclosure linear feature and accompanying pit features. The location of Trench 2/2012 (32 m²) was chosen with the purpose of investigating a segment of what had been

believed to be the "outer" linear feature of the crescent shaped enclosure. Trench 3/2012 (32 m^2) was marked out with the idea of exploring an apparent gap in a linear feature, revealed by the magnetometer survey – of major interest was the character of this break of continuity. Finally, Trench 4/2012 (30 m^2) was positioned to enable the examining of what had seemed to be either an intersection of two or three linear features, or a sharp bend of just one feature.

Within all four trenches, outlines of the features became soon visible, after modern ploughsoil (Ap horizon) had been removed. Their distribution largely corresponded with geomagnetic survey indications, confirming the accuracy of the prospection.



FIGURE 6. Dobkowice, site 12, Kobierzyce commune, Dolnośląskie Voivodeship. Magnetogramme showing the area of Trench 2/2012, plan of archaeological features discovered in Trench 2/2012 and chosen ditch profiles.

The excavation procedure aimed at exposing the profiles of archaeological features, so that their stratification could be examined and appropriate sample material collected. A recording system based on the use of the Harris matrix was applied, together with the concepts of "cuts" and "fills", designated as discrete stratigraphic units. Archaeological features, conceived as sets of cuts and fills were given separate numbers. The exploration of archaeological contexts: the recognised fills of features, involved the methodical removing of 0.10 m thick spits ("mechanical layers"); the position of

artefacts and samples was recorded within the system of these artificial layers and stratigraphic units (fills). This was to assure that post-ex analyses would be conducted on samples of known position. Each stratigraphic unit and each artificial layer was sampled for archaeobotanical analyses, separate samples were also taken for radiocarbon dating and soil/sediment micromorphology with complementary analyses (total phosphate, magnetic susceptibility).

Both pits in Trench 1/2012 were quite shallow (001 max. depth: 0.20 m, 002 max. depth: 0.17 m) and filled

by one fill, however they delivered a considerable amount of pottery and flint fragments (*Figure 5*). The "inner" enclosure ditch/elongated pit (feature 003) exhibited complex stratification: the main ditch cut (max. depth: 0.91 m) had been filled with 4–5 major fills, the most recent of which appeared to have been further recut by another ditch, filled by one fill. This would indicate two main "construction" episodes related to the linear feature in Trench 1/2012, separated by a period of time: 1) digging of the main ditch and 2) after its infilling/backfilling, the digging of another ditch, which closely followed the course of the first one (*Figure 5*).

The discovery of a burial within the fills of ditch 003 came as a surprise, but one which had been hoped for. The stratigraphic relation between the deposited remains and the feature remains unclear, since the grave pit cut was imperceptible during excavation. The position of the skeletal remains is generally perpendicular to the ditch orientation; also the grave protrudes slightly from the ditch when viewed in plan (*Figure 5*). The following stratigraphic relations are possible: 1) the grave pre-dates the ditch – the ditch was cut into the grave fill; 2) the grave was dug into one of the ditch fills (the ditch still being not fully infilled/backfilled at that time); 3) the grave was dug into the ditch after its complete infilling/backfilling. A better understanding of the formation history of the ditch fills may shed more light on this issue.

The stratification of the "outer" enclosure ditch/elongated pit (feature 004) in Trench 2/2012, consisted of 2–3 superimposed fills, the depth of the cut reaching 0.84 m from the surface of the trench (*Figure 6*).

Excavations of archaeological features within Trench 3/2012, revealed a gradual shallowing of both ditches/elongated pits (designated features 007 and 008) in their longitudinal sections towards the centre of the Trench, where they terminated (Figure 7). The width of the gap between them measured 0.76 m. The stratification of ditch 007 consisted of 3-4 superimposed fills, within a cut of a maximum depth of 0.36 m. One of the fills included a significant amount of charcoal, with a burnt clay layer directly above it, which may indicate an episode of in situ burning. Two superimposed fills were identified within the cut of ditch 008 (max. depth: 0.44 m). The character of these ditches remains unclear: they somewhat differ in the aspect of size from other linear features identified at the site, both being more narrow and shallow. This may, however, be due to the proximity of their terminuses. Another question concerns the temporal relationship between both ditches: if they had existed (being open) at the same time, the gap between them would have constituted a break in the continuity, which

may be interpreted as an entrance. This temporal relationship may be difficult to pinpoint at the moment, as the ditch fills yielded almost no finds (one pottery shard), also no suitable dating material was found.

The stratification of features within Trench 4/2012 revealed in the course of excavation, proved to be a complex one (Figure 8). After a careful assessment five feature numbers were assigned. The observed relationships between the ditches/elongated pits allowed for the following sequence of six stratigraphic events to be proposed: 1) the digging and infilling/backfilling of a ditch orientated SW-NE (feature 010, max. depth: 0.71 m); 2) re-cutting of the fill of ditch 010 in the SW corner of Trench 4/2012 by a ditch/pit cut (feature 009, max. depth: 0.28 m) and the infilling/backfilling of this cut; 3) an episode of re-cutting of the fill of feature 009 by a ditch/pit cut (feature 006, max. depth: 0.35 m) and the subsequent infilling/backfilling of this cut; 4) digging of a SE-NW orientated ditch (feature 012, max. depth: 0.68 m), which was dug into the fill of ditch 010 in the eastern of Trench and the following part 4/2012 infilling/backfilling of this feature; 5) digging of another SE–NW oriented ditch (feature 011, max. depth: 0.72 m) which was dug into the fill of ditch 012 and shared the same alignment. It seems that both features 011 and 012 terminated in the eastern part of Trench 4/2012; 6) the deposition of a thin (max. thickness: 0.12 m) blackish layer (1048) in the central-eastern part of Trench 4/2012. Events 2-3 and 4-6 are spatially separated, so their temporal relationship cannot be given. Based on this interpretation of the stratification, it would appear, that the crescent shaped enclosure ditches/elongated pits post-date the features that form the roughly rectangular enclosure, visible in the western area of the site. It is hoped, that an analysis and classification of recovered artefacts will enable the verification of this hypothesis, which is based on stratigraphic findings.

POST-EX ANALYSES

Geoarchaeological methods: soil micromorphology, phosphate analysis and magnetic susceptibility

Micromorphological analyses of soils and sediments are carried out on undisturbed samples of such materials with the use of microscopic techniques. The application of this geoarchaeological method during the investigation of a site, gives insight into the genesis of a given soil/sediment, and the alteration, to which it has been subjected after deposition. Micromorphological analyses of archaeological deposits can be extremely useful in answering questions of feature formation processes, and deliver information concerning past land use practices within the sampled area. For the description of thin sections, uniform protocols have been proposed (Bullock *et al.* 1985, Stoops 2003), and a growing body of case studies discussing various soil/sediment processes is available for comparison and reference (see e.g. Stoops *et al.* 2010).

During the excavation phase of the Dobkowice project, two ditch profiles were sampled for micromorphological analyses, with a total of eight samples collected: five from feature 003 and three from feature 004 (*Figure 9*). Separate samples were also taken from the fills of feature 004 for phosphate content analysis and magnetic susceptibility. The main research goal, pursued through the use of these geoarchaeological methods, was the determination of processes governing the formation of ditch fills and their subsequent alteration. Of vital interest was also the human impact on these processes: identifying the full set of these



FIGURE 7. Dobkowice, site 12, Kobierzyce commune, Dolnośląskie Voivodeship. Magnetogramme showing the area of Trench 3/2012, plan of archaeological features discovered in Trench 3/2012 and chosen ditch profiles.

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FIGURE 8. Dobkowice, site 12, Kobierzyce commune, Dolnośląskie Voivodeship. Magnetogramme showing the area of Trench 4/2012, plan of archaeological features discovered in Trench 4/2012 and chosen ditch profiles.



FIGURE 9. Dobkowice, site 12, Kobierzyce commune, Dolnośląskie Voivodeship. Profile of ditch 004 with the location of samples for soil/sediment micromorphology analysis.

factors could contribute to understanding the function of the ditches, as well as land use patterns in their vicinity.

The preliminary results of geoarchaeological investigations, suggest different modes of fill formation within features 003 and 004: a rapid process in the first instance and a slower, more gradual one in the latter case. Also, both features seem to have been subjected to water table fluctuations, at the same time, there was no evidence of longer periods of water saturation (standing water). Considerable amounts of anthropogenic wood ash and microcharcoal were also identified in the Dobkowice thin sections, they are evidence of human land use activities in the vicinity of the ditches/elongated pits. High values of magnetic susceptibility in feature 004 samples seem to corroborate these findings. Also of significance are low levels of phosphate in the same feature 004 samples. A detailed report summing up the geoarchaeological investigations is forthcoming.

Archaeobotanical analysis

During the excavations each stratigraphic unit (fill) was sampled for archaeobotanical analyses; samples were taken from all of the 0.10 m thick spits, which were successively removed in the excavation process. The results of these analyses will form the basis for further studies, regarding environmental changes and matters of economy and land use.

Preliminary results of archaeobotanical analyses indicate a presence of remnants of wood, cereals and wild herbaceous plants. Oak (*Quercus* sp.) and probably birch (cf. *Betula* sp.) were identified among the charcoal fragments. The most common cereal remains were einkorn (*Triticum monococcum*) and emmer (*Triticum dicoccon*) as well as *Triticum monococcum/dicoccon/ spelta*. The presence of weeds has also been recorded, mainly ones connected to farming of cereals: brome or brome grass (*Bromus* sp.), black bindweed (*Fallopia convolvulus*), yellow bristle grass (*Setaria pumila*), green bristle grass/hooked bristle grass (*Setaria viridis/ verticillata*) and common knotgrass (*Polygonum aviculare*) (Lityńska-Zając 2005). A most interesting discovery was the recognition of feather grass or stipa (cf. *Stipa* sp.) remains in samples from different features. Stipa is a xerothermic plant, currently rarely found in Poland, associated with wide, open spaces (e.g. steppe). In the Central European context, its occurrence is most probably related to intensive landscape management by humans – deforestation and stockherding. In the Middle East stipa was used as an edible plant (Hillman 2000), however, also other possible applications have been suggested: being easily combustible, it may have served in the process of sterilising storage pits with fire before cereal deposition, also bundles of stipa may have been used to isolate stored cereals from dampness, furthermore, it may have been utilised as decoration and ornament, possibly in ritual contexts (Bieniek 2002, Bieniek, Pokorný 2005).

Anthropological analysis of human burial

Specific soil conditions may cause poor preservation of bone material (Baxter 2004), which affects both faunal and anthropological remnants. During the excavations at Dobkowice, the presence of an anthropologist on site allowed for a proper assessment and recording of a fragmented and very poorly preserved human burial, which was discovered within the fills of a ditch/elongated





М3	M2	M1	P4	P3	С	12	11	11	12	С	P3	P4	M1	M2	M3
	*	*	*	*	*	*	*	*		*					
	*	*	*	*	*	*	*		*					*	
М3	M2	M1	P4	P3	С	12	11	11	12	С	P3	P4	M1	M2	M3

m2	m1	с	i2	i1	i1	i2	с	m1	m2
*	*				× .				
*	*	*							
m2	m1	с	i2	i1	i1	i2	с	m1	m2

FIGURE 10. Dobkowice, site 12, Kobierzyce commune, Dolnośląskie Voivodeship. Child burial (feature 005): record of deciduous and permanent dentition of a 7 years-old (\pm 2 years) child. Poor preservation of most of the permanent dental roots did not permit marking them in the chart.

pit (feature 003) in Trench 1/2012. The recovered osteological remains included the teeth, fragments of ulnae and radius shafts, and fragments of tibia and fibula shafts. During the exploration of the burial, it became apparent that the body had been placed in the grave pit on the right hand side, with the face towards the NE. The

age was estimated at 7 years (± 2 years), on the basis of the degree of teeth eruption (Scheuer, Black 1989, Ubelaker 1989) (*Figure 10*). The identification of the buried individuals' sex was impossible, due to the lack of appropriate diagnostic material.



FIGURE 11. Dobkowice, site 12, Kobierzyce commune, Dolnośląskie Voivodeship. Selection of pottery fragments.

Pottery fragments analysis

Over 450 fragments of pottery were found during the excavations at Dobkowice in 2012. Apart from two nearly intact vessels (a bowl and twin handled jug), deposited with the child burial, the pottery assemblage is quite fragmented and shows signs of erosion. This may suggest a complex depositional history of this material, also its re-depositing. The majority of pottery finds (ca. 60%) have been discovered in the fills of two pits in Trench 1/2012 (features 001 and 002). The number of potsherds found in the ditches/elongated pits is relatively small.

The pots were mostly produced from clay tempered with fine ground/crushed ceramic material, the use of fine grained mineral temper was more rare, occasionally, both types of temper were used by the potters. Because of a high degree of fragmentation of the potsherds, it is difficult to identify the full inventory of vessel forms. Surely, distinctive double handled jugs can be recognised (Figure 11:1-6, 10-11, 17-18, 23-24, 31-33), decorated with engraved lines and imprints, mainly in their central parts. Also, quite common are various bowl-like forms (Figure 11:14–15, 19, 37). All of the burials discovered at Dobkowice (in 2012 and in previous years) were equipped exclusively with both these vessel types, these two forms are also most common as grave goods on other Jordanów culture sites. Other identified forms are pots/vases (Figure 11:22, 30), including double-conical ones (Figure 11:19, 20, 26), vessels with a funnelled neck (Figure 11:39) and possibly also amphorae types, with horizontally pierced handles.

About 7% of the potsherds are ornamented. The most common decorative motifs are various combinations of engraved lines, occasionally with the addition of rounded or oval imprints organised in lines (*Figure 11:1–6, 10–11, 17–18, 23–24, 31–33*). Plastic ornamentation is also present, in the form of various types of nodules/buttons, placed either beneath the vessels' rim (*Figure 11:27, 39*), or in their central, most wide parts (*Figure 11:9, 12, 19, 21, 25, 26*). Some of the pots were equipped with handles, including massive ones, with vertical or horizontal piercing, usually located beneath the rim of the vessel (*Figure 11:15, 28*).

The pottery discovered at Dobkowice in 2012, displays a great many of the common characteristics of Silesian Jordanów culture pottery, nevertheless, two specific features of the Dobkowice assemblage should be noted. Firstly, the widespread custom of adding fine ground/crushed ceramic temper to the clay is quite distinctive, whereas a marked preference for mineral temper was identified on other Jordanów culture sites. Secondly, the relatively low diversity of ornamentation is worth mentioning. At the current stage of research, it is difficult to explain the reasons behind these differences. They can either point out to a local specific of the Dobkowice pot-making or possible chronological differences.

Flint artefacts analysis

A total of 32 flint artefacts were found in the four trenches. Over 60% of them came from the two pits found in Trench 1/2012 (Table 1). All of the artefacts were made of the same raw material - local, erratic flint. Some of the forms, including all of the five bipolar cores (Figure 12:1, 2), were made of small flint chunks and nodules, which could have been extracted from the layer of fluvioglacial gravel visible in the lower parts of the ditches. Flakes constituted approximately one third of the assemblage and half of them could be identified as being made by bipolar knapping (Table 2). The blades in turn were mostly regular, with attributes typical of indirect percussion: most often parallel edges and dorsal ridges and s-shaped proximal part with traces of trimming (Figure 12:3, 4; see also Mateiciucová 2008: 69-70).

Only blades were retouched and used as tools. Except one (*Figure 12:9*) all were based on regular blades and could be classified as two endscrapers (e.g. *Figure 12:6*), two retouched blades (*Figure 12:4, 9*), a truncated blade

TABLE 1. Flint artefacts, contexts of discovery.

	Archaeological context									
Trench	Ploughsoil	Ditch	Pit	Burial	Total					
I/12	2	2	22	1	27					
II/12	0	2	0	0	2					
IV/12	0	3	0	0	3					
Total	2	7	22	1	32					

TABLE 2. Flint artefacts, general structure of the assemblage.

Category									
Trench	Flakes	Blades	Cores	Tools	Waste	Total			
I/12	7	4	5	5	6	27			
II/12	2	0	0	0	0	2			
IV/12	1	0	0	2	0	3			
Total	10	4	5	7	6	32			



FIGURE 12. Dobkowice, site 12, Kobierzyce commune, Dolnośląskie Voivodeship. Selection of flint artefacts.

(*Figure 12:3*), a trapeze (*Figure 12:8*) and a bifacial, heart-shaped arrowhead (*Figure 12:7*).

Despite a limited amount of data due to the small size of the assemblage, it seems that the characteristics of the major aspect of lithic technology, that is the blade technology, are consistent with what has already been known about the Jordanów cultures' flint industry. The blades found in 2012 are technologically identical with the ones found amongst the grave goods of the burial discovered by accident in 1971 (Lech, Noworyta 1979: Fig. 2), as well as the ones from the nearby settlement at Tyniec Mały (Lech 1986). The attributes of the flint assemblage discovered at Dobkowice in 2012 show close similarities to flint material known from previous excavations in the 1970s and 1980s (Czarniak 2011: Tab. 8) in several aspects: the small size of the assemblage, the pronounced role of bipolar knapping and domination of flake debitage, combined with relying on local raw material sources. There is, however, one difference – the excavations from the late 1970s and early 1980s yielded no regular blade tools. Only three tools were found then: two expedient flake tools and a perforator made of a small, cortical blade. This discrepancy, although quite intriguing, would be very hard to explain without a detailed spatial and chronological analysis of the entire settlement area.

DISCUSSION

Looking at the results of the research at Dobkowice, one feels inclined to put forward a question about the meaning and importance of enclosed sites to members of those Neolithic farming communities, which we nowadays classify as Jordanów culture groups. Apart from the site at Dobkowice, such enclosures were discovered at Tyniec Mały (Noworyta 1986) and Wrocław, Krzycka Street (P. Jarysz pers. comm.). The current state of research does not permit detailed comparisons, however certain common characteristics of the enclosure features may be pointed out.

The ditches/elongated pits discovered on all three above-mentioned Jordanów culture sites seem similar, all being composed of segments of various length, which, in many cases, were probably connected in their upper fill parts. At the moment, the formation process of these linear features cannot be precisely determined: were they dug during a single event, enclosing a previously marked out area, or were they created in phases, with consecutive segments being dug at various chronological stages of the enclosures' existence, as has been recognised in the case of LBK pit-enclosures, (e.g. Herxheim and Rosheim) (Haack 2009, Jeunesse, Lefranc 1999, Zeeb-Lanz et al. 2009), causewayed enclosures (e.g. Windmill Hill) (Whittle et al. 1999), or "systemditches" (e.g. Sarup) (Andersen 1997). The latter seems more likely, at least in the case of Dobkowice: the stratigraphic relations identified in Trenches 1/2012 and 4/2012 (see above), suggest different chronological phases of re-digging of ditches/elongated pits. This issue certainly requires further investigation, and corroboration by other than only stratigraphic evidence.

The separate segments of the Jordanów culture enclosures displayed marked diversity in form and size: the ditch edges were not always parallel but irregular instead, the shapes of the profiles were also varied (U, V, and Y-shaped), and the bottoms uneven (see *Figures* 5-8). The possible presence of accompanying palisades or other wooden constructions has not yet been confirmed, there are also no data explicitly suggesting the existence of embankments. The understanding of processes, which governed the formation of the ditch fills, also remains limited, however micromorphological analyses of samples from Dobkowice seem to reveal some information on this subject.

At the Tyniec Mały site, the majority of artefacts (especially pottery) and animal osteological material were discovered within the ditch fills, particularly the upper fills (Noworyta 1986). A different situation was encountered during research in Dobkowice, both in the 1980s (a small number of finds in ditches 1–3, a large amount of finds in ditches 6 and 12; Czarniak 2011) and in 2012 (the majority of pottery found in the two pits). Perhaps this is due to a worse state of preservation of the site at Dobkowice, where the upper parts of the upper fills of features may have not survived to present times.

Of particular interest is the child burial discovered in 2012 within the fills of one of the enclosure ditches/elongated pits at Dobkowice. The body had been deposited according to rites typical for the communities belonging to the Jordanów culture, and grave goods comprised pottery and copper artefacts. So far, there is no analogy for this type of ditch burial on other known Jordanów culture sites.

The tradition of depositing the dead within ditch fills or in still open ditches (not yet infilled/backfilled), so in essence the usage of the ditch space as burial ground, first appeared in Central Europe in the Earliest Neolithic. Human skeletal material was uncovered during excavations on enclosed Linear Pottery Culture (LBK) settlement sites (Boelicke 1988, Boulestin et al. 2009, Haack 2009, Höckmann 1990, Kaufmann 1990, 1997, Krause 1997, 1998, Orschiedt, Haidle 2006, Teschler-Nicola et al. 1996, Vencl 1999). These burials belong to a heterogeneous group, and differ mainly in aspects of: 1) form and treatment of the deposited remains, with burials both in anatomical order, as well as fragmented, some of these fragmentations being also the result of armed conflict (Teschler-Nicola et al. 1996) and 2) deposition circumstances, with burials dug into the fills of previously infilled/backfilled ditches, and/or deposited within an open ditch. It must also be remembered, that features having the overall appearance of a ditch, may in

fact be a series of intercutting elongated pits (e.g. Herxheim, see Haack 2009, Schmidt 2004).

Burials equipped with grave goods comprising ceramic vessels, as well as flint, stone and copper artefacts, were discovered on both excavated enclosed Jordanów culture sites (Dobkowice and Tyniec Mały); they display close analogies to burials known from other Jordanów culture sites (Mozgała, Murzyński 2012, Noworyta 1986). The accidental nature of discovery, and very poor preservation of the graves uncovered at Dobkowice in the 1970s and 1980s, does not permit any inference about their ritual context. The investigation of preserved human osteological material, from two similarly disturbed burials from Tyniec Mały (graves 1 and 4) revealed, that the first one belonged to an adultus female, whereas the second one contained the remains of a maturus male and an adultus female (Miszkiewicz 1986). Evidence of further activities, possibly of ritual character, was also uncovered during research at this site: a pit (feature 20) with fragmented remains of two adultus male individuals deposited at the bottom was excavated. It is also possible, that the deposit of three vessels interpreted as a remnant of a burial, also belongs to the area of ritual activity on this site (Noworyta 1986).

It seems that a common characteristic of enclosed Jordanów culture sites is a limited number of archaeological features, which can be interpreted as residential, or being connected to economical activities. However, it must to be remembered, that the total excavated area of the sites at Tyniec Mały and Dobkowice was relatively small, moreover, in the case of Dobkowice the overall picture of the settlement is distorted, because of permanent damage done to the central part of the site by gravel extraction. On the other hand, features connected with the use of fire were discovered on both these sites (features 4, 8, 9, 15, and 16 at Tyniec Mały and features 001 and 002 at Dobkowice). This functional interpretation of these features, finds confirmation in the preliminary results of micromorphological and magnetic susceptibility analyses of sediment samples from the Dobkowice ditches (003 and 004), which indicate a presence of micro-charcoal (see above, report forthcoming). This is however not unexpected on a settlement site.

Another common element linking both these enclosed Jordanów culture sites is the representation of particular animal species in the faunal osteological assemblage. In both cases, analyses have revealed a predominance of cattle remains (Tyniec Mały: 94.5%, Dobkowice: 94.2%), along with the presence of pig, sheep/goat and horse bones (Czarniak 2011, Noworyta 1986). The sites at Tyniec Mały and Dobkowice also share a similar location in the landscape, being situated in the higher reaches of minor river (stream) valleys, in a considerable distance from their present riverbeds (400–500 m). This distance from flowing water is exceptionally long, when compared with the location of the majority of Neolithic settlements in the region.

The results of excavations at Tyniec Mały in the 1970s formed the basis of the first interpretations of this site. The presence of ditches/elongated pits within the settlement area was noted, however, doubts if the enclosed area had contained features of a residential character, were also underlined. The functional interpretation was based on an osteological analysis of faunal remains, which showed a predominance of cattle bone material. This led to the assumption, that the enclosure might have primarily served as an animal pen (krall), in some instances also capable of offering protection to humans (Noworyta 1986).

On the other hand, according to Kulczycka-Leciejewiczowa (1997), the ditches uncovered at Tyniec Mały were remnants of clay extracting pits; supposedly the clay had been used to paste a wooden fencing (not preserved in any form to contemporary times), which surrounded a settlement formed of households, among which burials were deposited, analogously to settlements of the Brześć Kujawski group of the Lengyel Culture (e.g. Osłonki, Krusza Zamkowa, see Grygiel, Bogucki 1997).

Also the discussion of recently published results of the 1980s investigations at Dobkowice follows very similar avenues of reasoning (Czarniak 2011). The lack of strictly residential features is being pointed out, what is supposedly indicative of an absence of long term settlement on this site; however, repeated short term habitation of the place is allowed in this interpretation. These short episodes are placed within a proposed hypothetical economical model of Jordanów culture groups, which is based on mobile stockherding; according to this interpretation, the Dobkowice enclosure was a temporary camp site with an animal pen (Czarniak 2011).

CONCLUSIONS

The above-mentioned interpretations are posited within a specific approach to culture-historical archaeology: traditional, positivist and based on naïve inductive reasoning. This approach does not consider the possible functional complexity of these enclosed sites, instead focusing only on simple economical interpretations. Remaining on a similar, very general level of reasoning, one can point out a number of arguments contesting the hypothesis of a kraal function of these Jordanów culture enclosures: an impractical location in the higher reaches of river valleys, far from flowing water sources, furthermore, the considerable amount of labour necessary to dig the ditches, when more simple ways of containing and protecting the stock are known, also from ethnographic accounts (see Keeley, Cahen 1989, Keeley *et al.* 2007: Fig. 6), finally the fact, that the ditches themselves may have posed a risk for the animals falling into them (Andersen 1997, Drewett 1977, Smith 1965).

Considering the voluminous literature on the subject of European Neolithic enclosures, one can observe, that just as the evolution of theoretical stances in archaeology reflected on the general defining of the Neolithic (in a nutshell: shifting from purely economic interpretations, to ones also encompassing ideology), similarly it also influenced the interpretations of enclosed sites. Their monumental character persuades, that also social and ritual contexts be taken into consideration at the interpretative level. Certain observations related to enclosed Jordanów culture sites seem to support this view: their position within the settlement network, location in the landscape, minor signs of occupation, or the presence of burials within the enclosed area and in ditches/elongated pits. A predominance of cattle bones in the faunal osteological assemblage (treated by some as a key argument to the kraal interpretation – see above), may also be of significance. The value of cattle for Neolithic communities seems widely accepted, not only in the aspect of being a source of food, but also as a sign of status, and of important symbolic meaning during ceremonial events (Cauvin 2000, Marciniak 2005, Russell 1998, Russell 1999). In this view, a ceremonial function of these sites: as places of gatherings, perhaps also funeral rites, seems, at least, worth considering. As such, they would have a role in social integration and identity building of these Jordanów culture communities.

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