



## MIERZANOWICE CULTURE SITE IN DOBRANOWICE, KRAKÓW DISTRICT

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*A b s t r a c t.* In 2019, two partially damaged features linked to the late phase of the Mierzanowice culture were examined during a short rescue survey in Dobranowice, Kraków district. A fragmentarily preserved human skeleton was discovered at the bottom of one of the pits. Aerial prospection established that the two examined features are part of an extensive Early Bronze Age settlement, perfectly legible in a highly eroded ploughed field. The site had not been previously recorded. It belongs to a settlement micro-region abundant in settlement and funerary finds of the Mierzanowice culture. The results of the research indicate that the archaeological resources of the Lesser Poland Upland are still insufficiently known and that systematic surveys using aerial photography should be undertaken.

*K e y w o r d s:* Early Bronze Age, Mierzanowice culture, Lesser Poland, funeral rite, settlement patterns

### INTRODUCTION

Loess areas of the Lesser Poland Upland abound in archaeological finds, with those dated to the Neolithic and the Early Bronze Age being particularly well represented. The increase in the number of known sites has been stimulated primarily by systematic surface surveys carried out as part of the Polish Archaeological Record programme. Their results provide grounds for a wide range of archaeological research and guide programmes of protection of archaeological sites. However, for a variety of reasons, actions aimed at registration of archaeological sites are not always fully successful,



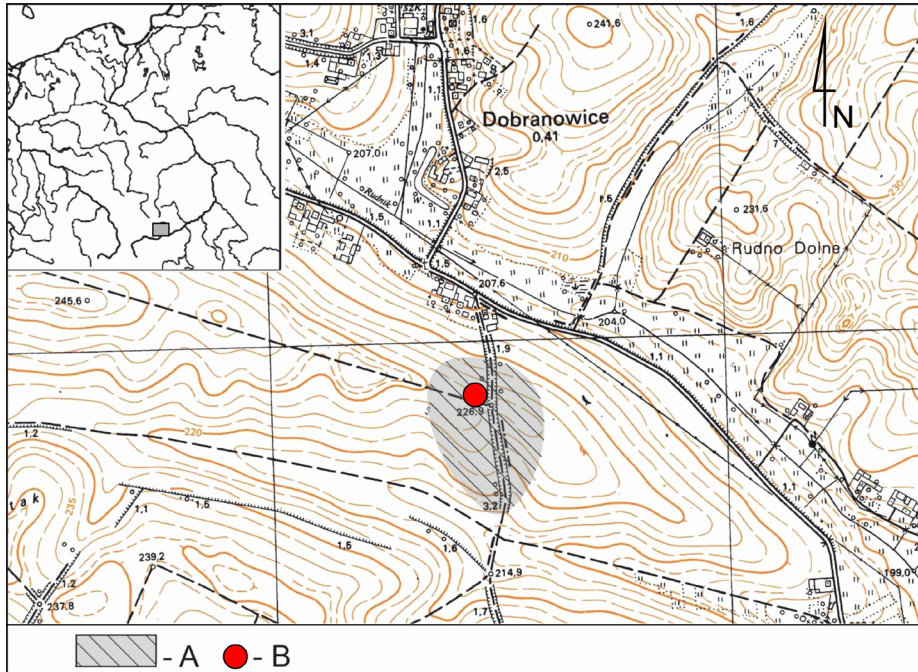


Fig. 1. Dobranowice, Igołomia-Wawrzeńczyce Commune, site 6. Location of rescue excavations from 2019. A – range of settlement of the Mierzanowice culture, B – place of excavation.

By M. Podsiadło, P. Włodarczak



Fig. 2. Dobranowice, Igołomia-Wawrzeńczyce Commune, site 6. View of the site from the north, with the area excavated in 2019 marked with arrow. Photo P. Włodarczak

meaning not every action results in a map showing at least the majority of the large sites in the surveyed area. This problem is well illustrated by site 6 at Dobranowice, located on the Proszowice Plateau (Figs 1 and 2). The site lies above the Rudnik valley, in a zone encompassing a concentration of sites dating to the Early Bronze Age (WŁODARCZAK 2020). In autumn 2019, accidental destruction of a grave during construction works led to the discovery of a large settlement of the Mierzanowice culture, which had not been noticed during several previous surface prospections, including the Polish Archaeological Record surveys. The short rescue excavations carried out at this site brought about more than just the discovery of interesting materials. The conservation aspect was important here as well, as the results can inform directions for future activities aimed at the identification of archaeological sites in loess areas.

### CIRCUMSTANCES OF DISCOVERY OF THE GRAVE

In November 2019, workers digging an irrigation ditch in a field in Dobranowice, Igołomia-Wawrzeńczyce commune, came across a human skeleton. Police officers, prosecutors, and then archaeologists from the heritage protection service and the Institute of Archaeology and Ethnology of the Polish Academy of Sciences (Mirosław Kuś and Piotr Włodarczak) were called to the site of the discovery, where they established that a burial of prehistoric age had been disturbed. The outline of the pit from which the human remains came was discernible in the walls of the ditch, and traces of another,



Fig. 3. Dobranowice, Igołomia-Wawrzeńczyce Commune, site 6. Features 1 and 2 during exploration.  
Photo M. Podsiadło



similar pit were identified nearby (Fig. 3). Unfortunately, much of the skeleton was excavated in good faith by its accidental discoverers and deposited nearby.

The discovery site is located on the culmination of a loess hill delimiting the valley of the Rudnik River – a tributary of the Vistula – from the south (Fig. 1). Approximately 500 m to the west, on the same loess hill, is located the archaeological site of Dobranowice 6 (AZP 101-60/92), where several fragments of Neolithic pottery were discovered (research by W. Morawski from 1988). No archaeological findings had previously been known on the eastern part of the hill, where the human remains were found.

## RESCUE EXCAVATIONS

In December 2019, acting on the request of the heritage protection office of Małopolskie Province, the authors of this paper carried out brief rescue digs aimed at examining the partially destroyed features (Fig. 3). The research revealed two damaged settlement pits of the Mierzanowice culture, located at a distance of one metre from each other. The work was limited to the exploration of their fills.

### *Feature 1*

Feature 1 was a pit, circular in plan and trapezoidal in cross-section (Fig. 4), with a diameter of 150 cm in the upper part and 165 cm in the bottom part. The trough-like bottom was recorded at a depth of 75 cm from ground level. The fill was homogeneous and consisted of dark brown humus soil. A small fragment of Mierzanowice culture pottery, a lump of daub, a fragment of a Jurassic flint flake, and a flint axe were found.

At the bottom, by the south-western wall, lay the skeleton of a woman of *senilis* age (Fig. 6; see Chapter „Human skeleton”). Much of it, including the skull and most of the long bones, had been recovered by the accidental explorers. Remaining *in situ* were the middle and lower spine, the pelvis, the right humerus, fragments of the right forearm, the left ulna, fragments of the femurs and a significant proportion of the ribs (Fig. 6). The position of the *in situ* fragments makes it possible to reconstruct the

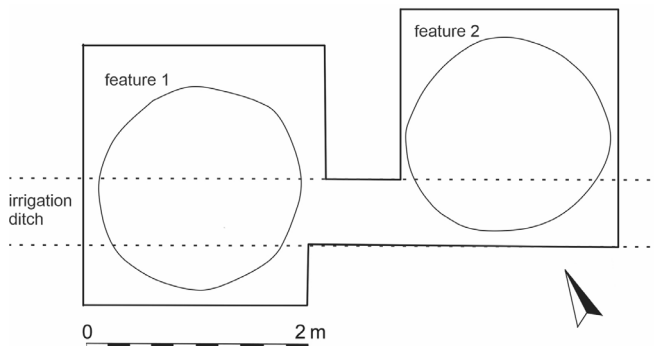


Fig. 4. Dobranowice, Igołomia-Wawrzeńczyce Commune, site 6. Plan of the trench explored in 2019

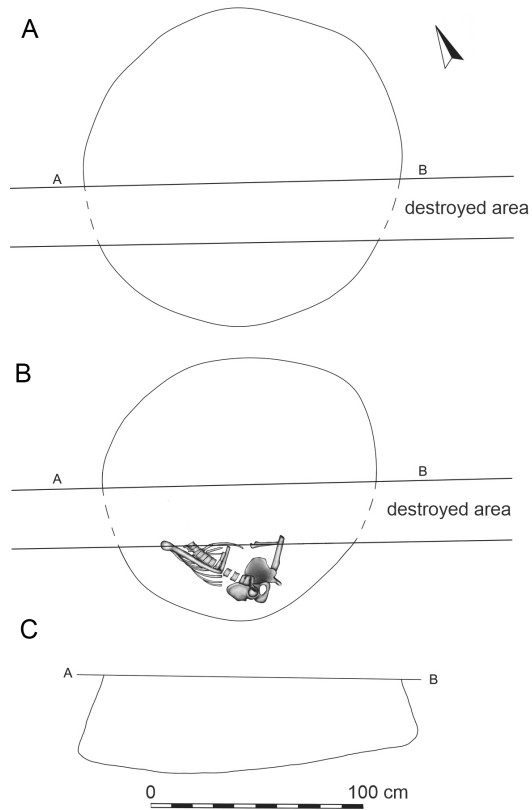


Fig. 5. Dobranowice, Igołomia-Wawrzeńczyce Commune, site 6. Feature 1: A – at a depth of 40 cm, B – at a depth of 75 cm, C – northern profile. Drawing by M. Podsiadło



Fig. 6. Dobranowice, Igołomia-Wawrzeńczyce Commune, site 6. Feature 1 – burial level (75 cm). Photo by M. Podsiadło

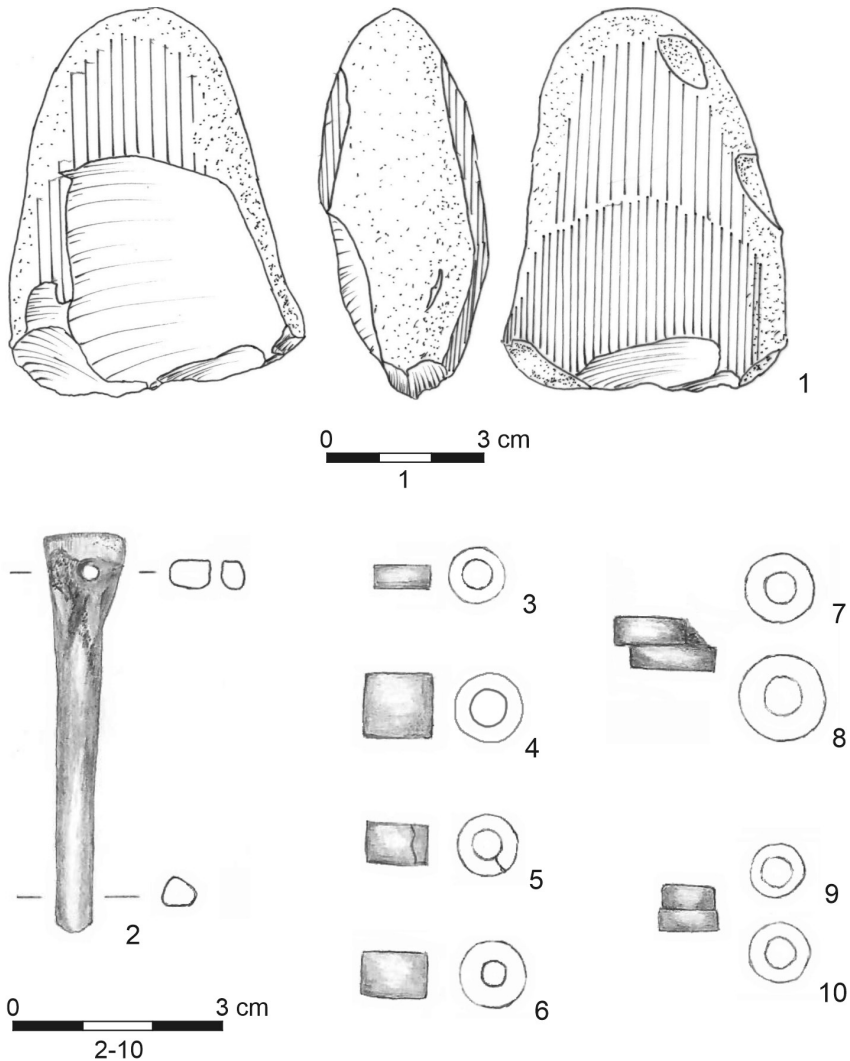


Fig. 7. Dobranowice, Igołomia-Wawrzeńczyce Commune, site 6. Feature 1: 1 – flint axe, 2 – antler pin, 3–10 – antler beads. Drawings by T. Oberc (1) and E. Włodarczak (2–10)

original arrangement of the body: on the left side, with the lower limbs contracted, and with the left upper limb straight and the right one bent at the elbow and placed at the waist. The burial was oriented along the NW-SE axis, head to the NW. A bone pin, eight bone beads, and an animal bone fragment were found when washing the human bones excavated by the accidental discoverers.

Archaeological materials from the pit:

1. Eight antler beads. The beads vary in diameter (from 7 to 12 mm) and thickness (from 3 to 9 mm), but they have similar hole diameters (approx. 4 mm) (Fig. 7: 3–10).

2. Damaged pin, with a hole in its widened head part. Macroscopic observation of the pin suggests that like the beads it was made of antler, although specialized analysis

would be required to confirm this assumption. Dimensions: preserved length 57 mm, width at the head 12 mm, hole diameter 4 mm (Fig. 7: 2).

3. Flint axe. Recovered from the fill of the pit, the small ground axe was made from a silica-carbonate rock of the gaize type. It is a raw material similar to what is known as “Cretaceous flint of type K”. The axe is 7.4 cm long, 3 cm thick, and 5.5 cm high. It is roughly lenticular in cross-section, with the butt part rounded. From the butt, the axe flares asymmetrically towards the blade, reaching its maximum width in this part. In the lateral view the course of unpolished edges can be described as concave-convex, which results in a slightly overhanging working part. Both faces of the tool were originally ground with a fine whetstone. However, this treatment did not extend to the butt itself or the edges. In top view the specimen probably originally had a roughly rhomboidal shape, with a strongly marked profiling achieved by a change in the grinding angle in the blade part, visible on the preserved side of the specimen approx. 4.5 cm from the butt. The contact angle between the butt and blade planes is approximately 155–165 degrees. The cutting edge itself has not survived, but the blade part shows traces of repairs, indicative of attempts to narrow the axe by removals from the side of the original cutting edge. On one face of the tool, this procedure produced a negative from the removal of a flake measuring over 4 cm in length, as well as several smaller scars in the blade part and on the edge. The removal of the largest flake probably eliminated the angle formed at the junction of butt and blade planes, similar to that visible on the other side. On the better-preserved face there is also a relatively deep negative left by an impact from the side of the blade, probably connected with attempts to repair the tool. Before the loss of the blade, the tool was probably about 2–3 cm longer (Fig. 7: 1).

## *Feature 2*

Feature 2, partially destroyed by the first explorers, was a pit, circular in plan (Fig. 8: A, B) and trapezoidal in vertical section (Fig. 8: C), with a diameter of 160 cm in the upper part and 200 cm in the bottom part. The flat bottom was recorded at a depth of 150 cm from the ground surface. The fill was mainly dark brown humus soil (Fig. 9), in places interspersed with lumps of yellow loess which collapsed from the walls. Seventeen fragments of Mierzanowice culture pottery were found, including sherds from a pot with textile imprints on the body. Also discovered were a spherical flint hammerstone, a flake of Jurassic flint, a fragment of a splintered piece (also of Jurassic flint), and a lump of daub.

During the excavation, a series of aerial photographs of the site were taken using a drone (Figs 2 and 10). These revealed that the explored features were located on the edge of a large settlement. In the highly eroded ploughed field, the outlines of extensive natural closed depressions and numerous circular or oval settlement pits were clearly discernible. They formed clear concentrations comprising features numbering from fewer than twenty to dozens. The pits occurred over an area measuring 200 × 50 m on the southern slope of the hill. From this place particularly convenient for prehistoric settlement,

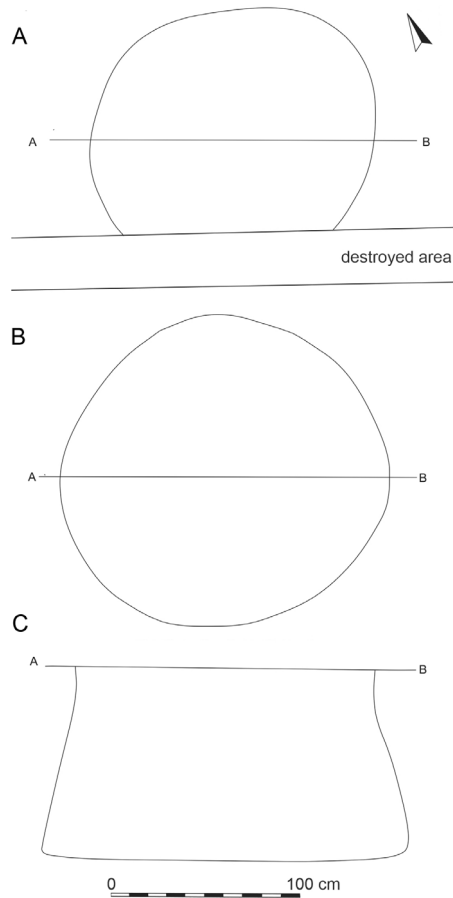


Fig. 8. Dobranowice, Igołomia-Wawrzeńczyce Commune, site 6. Feature 2: A – at a depth of 40 cm, B – at a depth of 90 cm, C – northern profile. Drawing by M. Podsiadło



Fig. 9. Dobranowice, Igołomia-Wawrzeńczyce Commune, site 6. Feature 2 at a depth of 90 cm. Photo P. Włodarczak



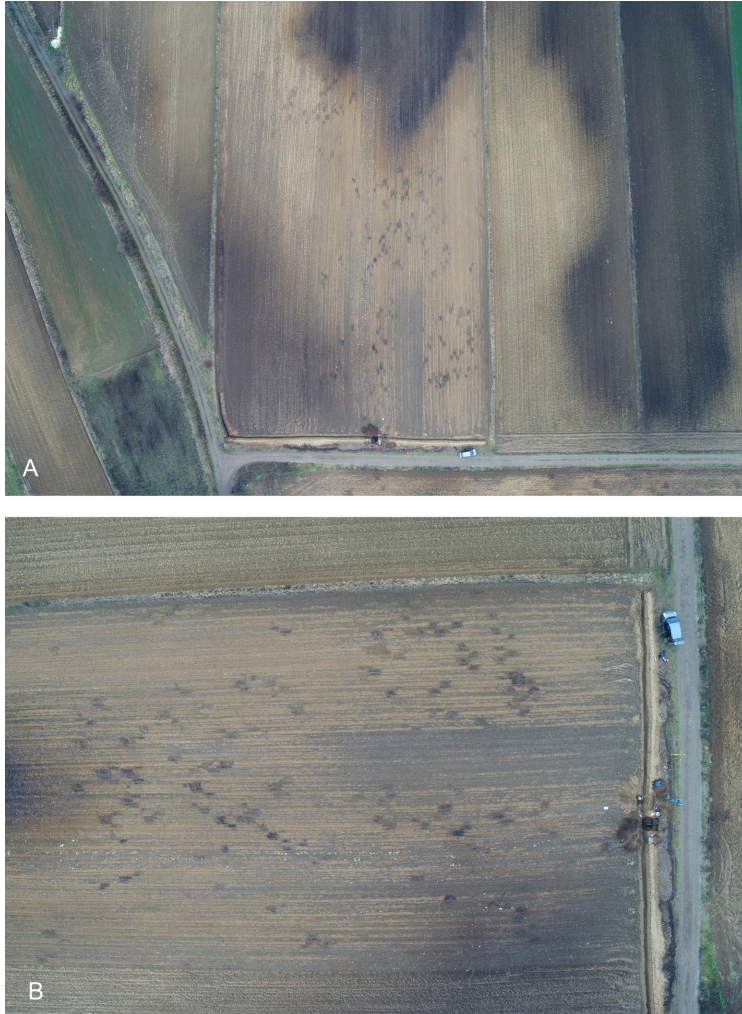


Fig. 10. Dobranowice, Igołomia-Wawrzeńczyce Commune, site 6. Settlement pits of the Mierzanowice culture: A – view from N, B – view from E. Photo P. Włodarczak

no discoveries had been previously known. This large settlement was not identified during the Polish Archaeological Record surveys either. Certainly, its traces must have become more clearly visible in recent years due to significant erosion caused by deep ploughing.

### ANALYSIS OF THE MATERIALS

The excavated features were located in the northern part of the extensive settlement zone identified from the air. The distribution of the features suggests that this is a settlement dated to the late phase of the Mierzanowice culture. This is indicated by the characteristic concentrations of circular storage pits. Analogous arrangements

have been recorded in recent years during open-area research carried out in connection with road construction projects, the best example being site 16 in Targowisko, Wieliczka district (WŁODARCZAK 2004). Large concentrations of pits are connected with the tendency towards grouping such features in specific zones within late Mierzanowice culture settlements. For western Lesser Poland this phenomenon was discussed on the occasion of the analysis of materials from the Babia Góra site in Iwanowice Włoszczańskie, Kraków district (KADROW 1991: 75, 83). This layout repeats the spatial patterns recorded on settlements from the 2<sup>nd</sup> millennium BC located in the Pannonian Plain (WŁODARCZAK 2017: 59) and it is diametrically different from the patterns observed in the early phases of the Mierzanowice culture (in the second half of the 3<sup>rd</sup> millennium BC).

The two investigated pits yielded only a small number of sherds, made in a technology characteristic of the late phase of the Mierzanowice culture. The fragments most probably come from medium-wall pots (wall thickness of 5–8 mm), made of ceramic mass tempered with crushed stone. The sherds from feature 2 have textile impressions. In terms of manufacture, these materials have most in common with the Giebułtów group of the Mierzanowice culture. A similar type of pottery is known from several nearby settlements, including site 2 in Dobranowice, sites 1 and 43 in Karwin, Proszowice district and site 39 in Stręgorzycze, Kraków district (WŁODARCZAK 2020: 106–109). The axe from feature 1 is not a very suitable diagnostic product for a detailed cultural-chronological classification. It was made of chert, a raw material similar to flint of type K (KACZANOWSKA, KOZŁOWSKI 1976: 207, 208). The latter was widely used in the manufacture of Early Bronze Age core tools in the Kraków region (cf. e.g. JAROSZ et al. 2010). Short bifacial axes, wide in the blade part and narrow at the butt, are characteristic mainly of the late phase of the Mierzanowice culture. This is evidenced by grave finds, which are particularly numerous in cemeteries from the Sandomierz Upland (BĄBEL 2013a: 101–103). Specimens similar to the axe from Dobranowice were discovered, among other places, in Świniary Stare, Sandomierz district a site similarly dated using the radiocarbon method (KRAUSSOWIE 1971: 134, Pl. III: 1, 4).

The skeleton of an adult female was discovered at the bottom of feature 1. The arrangement of the corpse and the presence of grave goods indicate that it was an intentional burial consistent with the rules of the Early Bronze Age funerary ritual. Burials in settlement pits were also discovered on other settlements of the Mierzanowice culture. This custom, a continuation of ritual behaviour from the Eneolithic, is recorded beginning from the older phase of the Early Bronze Age (proto- and early-Mierzanowice phases; e.g. JAROSZ et al. 2020). Graves in settlement pits are also known from the late phase of the Mierzanowice culture, e.g. from Szarbia Zwierzyniecka, Kazimierza Wielka district (BACZYŃSKA 1994: 36). In some of these sites, as in the case of Dobranowice, skeletons were furnished with objects analogous to those found in graves from regular cemeteries. Some of these burials in settlement pits were even richly furnished – as in Ożańsk, Jarosław district in the Rzeszów Foothills (LIGODA, PODGÓRSKA-CZOPEK 2011: 202, 205). It is therefore difficult to interpret the custom of burying the dead outside cemeteries. The presence of grave goods and the careful

placement of the body indicates that burial in a pit was not an act of desecration of the deceased. People of the late Mierzanowice culture used various forms of burials, including in large cemeteries, small cemeteries, within settlements, and in barrows (WŁODARCZAK 2017: 61–69). This diversity probably reflects the still difficult-to-decipher complexity of Early Bronze Age communities of Lesser Poland.

The furnishings of the deceased from feature 1 were comprised of cylindrical beads made of antler and a pin, which are exclusively ornaments and elements of clothing. These are typical artefacts in Mierzanowice culture graves. Importantly, both the beads and the pin with the widened and flattened head are objects occurring in assemblages dated from the turn of the 3<sup>rd</sup> and 2<sup>nd</sup> millennia BC onwards, that is, starting from the classic phase. Cylindrical beads made of bone or antler were present in graves from cemeteries dated to this period in Świniary Stare (KRAUSSOWIE 1971: 127) and in Żerniki Górne, Busko Zdrój district (KEMPISTY 1978: 310). They are common in the late phase of the Mierzanowice culture, as exemplified by inventories from cemeteries at Iwanowice “Babia Góra” (KADROW, MACHNIKOWIE 1992: 78–80) and Mierzanowice, Opatów district (BĄBEL 2013a: 144–146). They are also known from cemeteries located relatively close to Dobranowice, from Szarbia, Proszowice district (site 14; unpublished research by B. Baczyńska) and Stręgorzyce-Tomaszów (site 21; KOSTRZEWSKI 1923; unpublished materials in the collection of the Archaeological Museum in Kraków). In some inventories bone or antler beads co-occur with faience beads and shell beads. The bone pin with a flat, pierced head was an equally typical element of the grave inventory, as such forms occur in many cemeteries (e.g. KADROW, MACHNIKOWIE 1992: 79, fig. 45: 8, 9; BĄBEL 2013b: 148, fig. 195: 3), including the aforementioned nearby cemeteries in Stręgorzyce-Tomaszów 21 and Szarbia 14. Both elements of the Dobranowice grave inventory are therefore typical elements of female grave furnishings in the classic and late phases of the Mierzanowice culture.

Site 6 in Dobranowice is located in a micro-region on the Ropotek and Rudnik Rivers abundant in finds of the Mierzanowice culture, especially in materials of the late phase (RYDZEWSKI 1986: 133, fig. 3; WŁODARCZAK 2020: 107–112). It is in this area that site 21 at Stręgorzyce-Tomaszów is located, which lent the Mierzanowice culture its earlier name (Tomaszów culture). Unfortunately, both these old and younger discoveries come mostly from patchy research and do not allow for a comprehensive description of the Early Bronze Age settlement patterns in this area. Exceptions are the results of excavations carried out in Szarbia: at site 7 (KADROW et al. 2019) and at the cemetery at site 14 (unpublished research by B. BACZYŃSKA, 2000). The results of surface prospections of the latter site hint at a cemetery of large size, possibly containing up to several hundred graves. Such a cemetery should be accompanied by a large, long-occupied settlement, located in close proximity to the graves (KADROW, MACHNIKOWIE 1992: 93). In the analysed micro-region, only the research at site 6 in Dobranowice presented here has confirmed the presence of a large settlement complex. The site uncovered by the aerial survey is one of several, maybe even more than a dozen, large settlements located on the hills overlooking the Ropotek and Rudnik valleys.

## HUMAN SKELETON

Anthropological analysis was carried out according to standard methods (WHITE, FOLKENS 2005).

The skeleton is almost complete, and is secondarily damaged. The preserved damaged calvaria belongs to a long skull (cranial index: 74.8; for measurements see Table 1) of medium build, with superciliary arches and external occipital crest weakly marked and small mastoid processes. All sutures are in the final stage of obliteration. Fragments of the mandible and the left maxilla with strongly attrited permanent teeth are preserved:

	M1	M2	
	M1	M2	M3

The occlusal surface of the left mandibular M3 shows carious lesions.

The preserved part of the axial skeleton includes most of the vertebrae: cervical (C1, C3-4), thoracic (Th 5-12), lumbar (L1-5) and a damaged sacrum, as well as fragments of right and left ribs. The upper limb is represented by a fragment of the acromial extremity of the clavicle, fragments of the right and left scapulae, damaged right and left humerus and ulnas, damaged right radius, as well as bones of the hand: wrist (lunate, hamate, trapezium, pisiform, triquetral), metacarpals (7) and phalanges (6) of the right and left hand. From the lower limb there are fragments of pelvic bones with sciatic sinusoidal notches, the left femur (430 mm) and damaged right femur, left patella, right tibia (340 mm), damaged left tibia, fragments of the right and left fibulas, and bones of the foot: tarsus (right and left talus bones, right and left calcaneus bones, and two cuneiform bones), metatarsus (7) and a phalanx of the right foot.

The preserved elements of the skeleton made it possible to establish that the remains belonged to a female of *Senilis* age (50–60 years of age) with a living stature of about 154–158 cm (following FORMICOLLA, FRANCESCHI 1996).

Table 1. Dobranowice, site 6. Skull measurements

Measurement	[mm]
<i>g-op</i>	179
<i>eu-eu</i>	134
<i>ft-ft</i>	106

## ANIMAL BONES FROM THE SETTLEMENT PITS

The bone remains from Dobranowice were identified based on comparative material stored in the collection of the Institute of Systematics and Evolution of Animals, Polish Academy of Sciences in Kraków. Animal remains were studied according to standard archaeozoological procedures (KLEIN, CRUZ-URIBE 1984; LYMAN 1994; REITZ, WING 1999; LASOTA-MOSKALEWSKA 2007). All the bone remains were subjected to detailed observations in order to identify the marks left by humans, carnivores, and rodents, or root plant activity.



In feature 1, a left calcaneus bone of cattle (*Bos taurus*) was discovered, with gnawing marks discernible on the distal part.

In feature 2, remains of four domestic species were identified: cattle, pig (*Sus scrofa* f. *domestica*), dog (*Canis familiaris*), and horse (*Equus caballus*). Bones of cattle are represented by an atlas bone and a proximal part of a radius bearing traces of fire and carnivore gnawing. Among the pig remains, the bones of a forelimb were identified: humerus, ulna and radius. Additionally, a mandible fragment of a mature individual was found. On the pig remains, marks of fire (radius) and carnivore gnawing (humerus) were noted. A completely preserved dog skull with mandibles was also discovered in feature 2. It belongs to a very young individual, and its preservation was possible due its calcite covering. Animal remains from feature 2 included the caudal part of a horse skull, with preserved occipital foramen. This specimen was included into domestic species, even though the morphometric features of the skeleton did not allow for determining whether the skull belonged to a domestic or wild animal. The interpretation was guided by the cultural context in which the horse skull was discovered, which dates from the times after the appearance of domesticated horses in this area (BENECKE 1994; LEVINE 2005).

## ABSOLUTE DATING

Radiocarbon dating was performed for a rib from the human burial (Fig. 11). The result was 3535±30 BP (Poz-120739), i.e. 1926–1778 BC (probability 68.2%); or 1951–1751 (probability 95.4%; calibration program OxCal v4.4.4 – using the INTCAL20 curve). In the chronological scheme developed for western Lesser Poland on the basis of the C14 series from the Iwanowice settlement (KADROW 1991; KADROW, MACHNIK 1993, 1997), the results correspond to the late phase of the Mierzanowice culture. Similar dates were obtained for the western Lesser Poland cemeteries in Szarbia Zwierzyniecka

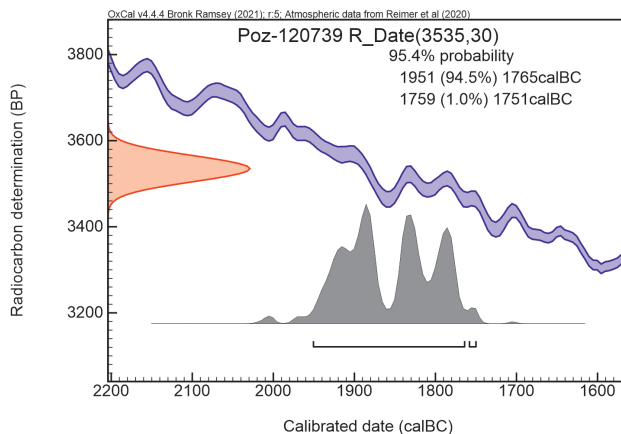


Fig. 11. Dobranowice, Igołomia-Wawrzeńczyce Commune, site 6. Radiocarbon dating of the human bones from the burial. The diagram created with Bronk Ramsey's OxCal v4.4.4 from 2021, using calibration curve INTCAL20 (REIMER et al. 2020)

(BACZYŃSKA 1985) and Świniary Stare (JURAS et al. 2020). On the other hand, graves from the nearby cemetery at site 14 in Szarbia, Proszowice district, produced slightly older dates (ca. 2000–1900 BC; WŁODARCZAK 2020: 112). It is probable that the absolute age obtained for feature 1 also corresponds to the dating of the whole settlement at site 6 in Dobranowice. This is indicated by the aforementioned pattern of arrangement of pits, characteristic for the late phase of the Mierzanowice culture. Most probably the obtained 14C date is connected with the material of the Giebułtów group, as indicated by the pottery from pits 1 and 2. This type of finds is also characteristic for the neighbouring sites from the Ropotek and Rudnik valleys, including the sites in Dobranowice and Karwin (WŁODARCZAK 2020: 106–109) and site 7 in Szarbia (KADROW et al. 2019).

## CONCLUSIONS

A short rescue operation at site 6 in Dobranowice produced results interesting for the study of the Early Bronze Age in western Lesser Poland. It revealed the presence of a large settlement with a layout characteristic of the late phase of the Mierzanowice culture. This discovery confirms the intensity of Early Bronze Age occupation on the southern edge of the Lesser Poland Upland, on the banks of the Ropotek and Rudnik Rivers, small left-bank tributaries of the Vistula River.

The grave of a woman buried in a settlement pit (feature 1) is another example where a specific funerary ritual is observed for some members of the Early Bronze Age population. In terms of its arrangement and furnishing, it does not differ from customs observed in large flat cemeteries of the late phase of the Mierzanowice culture.

All animal remains discovered in features 1 and 2 belong to domestic species. Archaeozoological data shows that animal remains (except for the dog skull) represent consumption leftovers, as evidenced by the presence of burning marks and traces of carnivore activity. The small number of animal remains makes it difficult to draw any broader conclusions about livestock management. The most interesting discovery is the presence of the horse skull fragment in feature 2, as horse is a species rarely discovered in Mierzanowice culture materials (MAKOWICZ-POLISZOT 1992; BĄBEL 2013a; WILCZYŃSKI et al. 2019).

Numerous finds of horse remains, as well as discoveries of harness elements, are connected with the Trzciniec culture (PRZYBYŁA 2020). Their presence in Lesser Poland sites coincides with the expansion of the Otomani culture, whose materials are also present in graves and settlement pits of the Trzciniec culture. In this context it is worth noting the views which consider temporal overlapping of the late phase of the Mierzanowice culture and the early phase of the Trzciniec culture (Górski, KADROW 1996). It is therefore possible that the finds from the late phase of the Mierzanowice culture coincide with the same stage of a clear and abrupt increase in the importance of the domesticated horse in Bronze Age communities of Central Europe.

Additionally, the research in Dobranowice showed the effectiveness of aerial prospecting in the documentation of new settlement sites in the loess uplands of Lesser Poland.

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