Non-destructive research of a double circular enclosure at Uherský Ostroh (Uherské Hradiště District, Czech Republic)

Nedestruktivní výzkum dvojitého rondelu u Uherského Ostrohu (okres Uherské Hradiště, Česká republika)

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KEYWORDS

ABSTRACT
The article informs about the discovery of the remains of a circular structure called a rondel, in this case featuring a double rondel in ‘Padělky’ field near Uherský Ostroh (SE Moravia, Czech Republic) and offers the results of non-destructive methods of research performed there in 2016–2020. The double circular complex was discovered during an analysis of satellite images of the Earth’s surface and subsequently verified by geophysical prospection. The resulting magnetogram revealed two ditches interrupted by five presumptive entrances at the site, along with dozens of anomalies that can be interpreted as potential archaeological features. Multiple-phase prehistoric occupation at the site was later proved by surface surveys. Occupation of the earlier phase of the Linear Pottery culture and the Lengyel culture has been documented. The age of the rondel itself remains an open question for the time being, however; it can only be clarified by a regular excavation. The present study discusses the existing possibilities of dating from various perspectives. Besides a probable dating the rondel to the Lengyel culture, a later, Early Eneolithic or Early Bronze Age, dating cannot be ruled out either.

1. Introduction
The growing number of new orthophotomaps of the terrain in recent years has led to increasingly frequent discoveries of previously unknown archaeological sites. The method of remote sensing and the use of the study of cropmarks on regularly made satellite images of the ground presented on various map portals has added considerably to aerial prospection, which started to be more widely used on Czech territory from the 1980s (Kovárník 1996; Gojda 1996; 1997; Hašek, Kovárník 1997; Podborský, Bálek 2000; Kuna ed. 2004, etc.). Besides the relatively frequently occurring marks of various settlement features or grave pits, more extensive structures are also revealed in satellite images, albeit less often, including, for instance, remnants of various fortifications and, last but not least, remnants of circular socio-cultic architecture – rondels. Thus identified prehistoric monuments include a double ditch complex near Uherský Ostroh (Kvačice cadastral area, Uherské Hradiště District; Czech Republic; Fig. 1). The site was discovered in 2016 by J. Bartík during the study of satellite images in Google Earth (on the application of software and methodology, see Kuzma 2013). In 2017–2020, the site was intensively examined by non-destructive methods of archaeological prospection in order to determine the precise course and age of the ditch enclosure. The main objective of this article is to present the gathered data and set it into a wider regional context. The fact that this is the very first documented double ditch enclosure in the region of southeastern Moravia, or more precisely on the left bank of the Morava River, makes the discovery even more important.

2. Site location and natural conditions
The site is situated in ‘Padělky’ field, ca 2.5 km NE of the centre of Uherský Ostroh (Fig. 1). In terms of its location in the relief, the ditch complex is situated on the boundary between an elevated plateau and a gentle SW slope (inclination of 3–4°) decreasing into the inundation of the nearby small Okluky River. The altitude is 185–190 m a.s.l.; the elevation difference above the floodplain is 3–8 m. The distance between the centre of the rondel and the present-day watercourse of the Okluky is ca 485 m. The site commands a good view of its vicinity, especially to the SE in the direction of the Okluky valley and the foothills of the White Carpathians (Fig. 2), but also to the SW in the direction of the confluence of the Okluky and the Morava River (left-bank tributary). The Okluky basin was part of important long-distance routes already in prehistory. In the west, it was connected to the main communication corridor in the NE–SW axis represented by the Lower Morava Valley. In the E–W axis, it was passed through by a route connecting Moravia and Slovakia within the ‘Pannonian-Elbe Route’. Thanks to this fact,
favourable landscape conditions and rich environmental resources, we register an unusually high quantity of archaeological sites there documenting intensive human occupation virtually throughout prehistory, the early historical period and the Early Middle Ages (cf. Hrubý 1951; Pavelčík 1967; 1968; 1970a; 1970b; 1990; Perňička 1973–1974; 1980; 1984; 1986; Koštuřík 1982; Procházka 1992; Hrubý, Pavelčík 1992; Galuška 2000; 2011; Meňoušková, Vaškových 2004; Zeman 2003–2004; 2015; Vaškových 2008; 2011; Škrdla, Ježek 2009; Schenk 2012; Válek et al. 2012; Chrástek, Bartík 2016; 2017; Bartík 2018; 2019a; 2019b; 2020; Bartík, Škrdla 2020; Bartík et al. 2021, etc.). From the geomorphological perspective, the site is situated on the eastern periphery of the Lower Morava Valley (part of the Pannonian Basin), whose relief is comprised of rolling lowland, terraces and water-course floodplains (Demek 1992, 38). Geologically, it is part of the Western Carpathians, the Magurian, White-Carpathian unit (16a) of the Outer Carpathians. The unit consists of flysch with alternating sandstone and mudstone. Sandstones predominate in the northeastern part in the Vlára development, and mudstones in the southwest in the Hluk development (Zapletal 1992, 64, Fig. 28). According to available map documents, the site’s subsoil is comprised of non-separated gravel of proluvial genetic origin situated in the sloping areas and dusty clay, sand and, in places, gravel situated higher on the plateau above the slope. In the southern, lower part of the slope passing into the Okluky inundation, geological surveys have detected loose sand-clay or clay-sand sediments of Pleistocene origin. Alluvial and muck soils are situated along the rivers in the Lower Morava Valley, while brown soils with a loess pedogenetic substrate developed on its periphery. The soil cover on the site we describe consists of arenic cambisol with a deep profile and high quality (Prax 1997, 43).

The neighbourhood of Uherský Ostroh is part of a very warm T2 climatic area with a very long, warm and dry summer. The spring and autumn are very short and warm there. The winter is short, mildly warm and dry, with very brief snow cover (Quitt, Tolasz 1992, 147–148; Grulich 1997b, 114–116). The area of interest is part of a periphery territory of the NW boundary of the distribution of thermophilic Pontic-Pannonian taxaons and the western boundary of West Carpathian endemic species and Carpathian taxaons (Grulich 1997a, 82–83, Fig. 17). In terms of phytogeographical classification, the microregion is part of the planar and, to a lesser extent, colline vegetational level. Representatives of the flora and vegetation with Pannonian influences occur. Riparian forests of the type of Pannonian lowland river hard meadows with narrow-leaved ash (Fraxino pannonicae-Ulmetum) are preserved in the floodplains, with oak in places (Chytrý 1997, 91; Grulich 1997b, 115–116).

3. Methods

So far, the double ditch complex near Uherský Ostroh has only been examined by non-destructive methods of archaeological prospection. Regular excavation has not been carried out yet. Remote sensing has been used for the identification and initial description of the ditch enclosure. All available satellite images of the Earth’s surface on map web portals were analysed; based on them, cropmarks indicating potential features at the site were
described. Drone photography of the area of interest was utilized as well (Fig. 2).

Based on the results of remote sensing, a geophysical survey was conducted in 2017. An overall area of 150 × 150 m was measured; the grid of measured polygons was situated so that the ditch complex was located in the central part of the examined area, which enabled the study of prospective other archaeological structures in its vicinity. The measurement itself was carried out using a Sensys fluxgate magnetometer (Germany) with two probes; the subsequent measurements took place in a grid with a cell density of 0.5 × 0.1 m (Tirpák 2017).

In order to acquire archaeological material that would enable more detailed dating of the chronological framework of human activities at the site and specify the age of the double ditch complex, the research at the site continued in 2017–2020 by surface survey supported by a hand-held Garmin GPS device (accuracy ± 3 m). The survey was carried out in the same grid system as the geophysical measurements, with the individual lines 2 m apart. The position was recorded for each artefact found. During a later evaluation in the ArcMap 10.4 software, it was possible to study the spatial distribution of various groups of finds and test possible relations between surface artefacts and features identified by geophysical prospection.

4. Results

4.1 Cropmark analysis

Cropmarks of the double circular complex were identified on two different map portals. The course of the ditches is the most distinct on Google Earth (Google Earth). Positive cropmarks (dark-green coloured grain) indicated parts of both ditches in an orthophotograph from 1 May 2009 (Fig. 3: A). Other cropmarks (beige-coloured grain above archaeological structures surrounded by brown-shade vegetation) of both ditches are visible in a later orthophoto from 12 July 2015. An almost identical image with cropmarks is shown in an orthophoto that is available in the geoportal of the Czech Office for Surveying, Mapping and Cadastre (Fig. 3: B; ČÚZK). No more crop or soil marks were discovered by aerial photography of the site using a drone.

A remarkable discovery is that the visibility of the individual parts of the ditches is the same in all the orthophotographs mentioned above: the N and NE are the best visible parts of the...
circular complex in all of them. For both ditches, the cropmarks gradually fade away approximately in the area of the SE quadrant. The course of the southern edge is partially visible only for the outer ditch, but not for the inner one. Cropmarks are almost entirely absent in the SW quadrant. More cropmarks were identified both inside the circular complex and in its close vicinity, presumably indicating the occurrence of settlement features of smaller dimensions (so-called maculae; cf. Gojda 1997; 2004, 103–108; Gojda et al. 2002, 382). These structures are accompanied by a distinctive cropmark of a large (ca 16.5 × 11.2 m) archaeological feature (probably a clay pit) situated only a few metres from the outer ditch, near the SE entrance to the circular complex.

The following dimensions of the double circular complex have been established based on measurements from the orthophotographs: the outer ditch diameter is about 101.4 m in the N–S axis and 101 m in the NW–SE axis. The inner ditch has a diameter of 57 m in all axes. The width of both ditches is ca 3 m, except for the NE course of the inner ditch where the cropmarks are somewhat wider, reaching almost 4 m.

4.2 Magnetometric measurement

The geophysical survey of the site brought positive results and confirmed the occurrence of potential features predicted based on the cropmarks visible in satellite images of the Earth’s surface. Several dozens of isometric magnetic anomalies were identified (Fig. 4: A, B); based on the measured nT values, they can be divided into three groups (Fig. 5).

The first group has the form of irregularly circular line anomalies in an interval from -10 to +25 nT. These anomalies can be interpreted as the layouts of two concentric ditches interrupted by entrances in several places, comprising the double rondel. The results of geophysical prospection thus confirmed the interpretation of the circular complex’s cropmarks and specified its real course, including places where cropmarks were not visible. Magnetometric measurements also determined the dimensions of the rondel’s ditches more precisely and made it possible to establish the precise number of entrances or interruptions of the ditches. No more linear elements (such as remnants of palisade trenches) were identified by the geophysical survey.

The dimensions (Fig. 6) of the ditches are slightly larger compared to the figures based on the cropmarks. While the outer ditch diameter mostly varies between 104 and 105 m in various axes of measurement, the inner ditch has a regular diameter of 57 m according to the resulting magnetogram. The distance between the outer edge of the inner ditch and the inner edge of the outer ditch is 20 m on average. The area of the whole circular complex is 0.86 ha (the overall circumference is 300 m). The inner ditch alone demarcates an area of 0.25 ha. The width of both ditches varies between 2.5 and 4 m in various parts of their course. The outer ditch of the rondel is interrupted by two entrances oriented to the NW (length of interruption of ca 1.5 m) and SEE (length of interruption of ca 3.3 m). The entrances are not opposite; the angle formed by their orientation is 140° (Fig. 6). The inner ditch has three presumptive entrances situated to the SE, SSW and NWW. Two of the entrances (SE and NWW) are almost opposite, forming an angle of about 85° with the third, SSW entrance. The SE entrance, with a 2.7 m interruption of the course of the ditch, is best visible. Only the SE segment of the inner ditch is equipped with a rectangular, 2 m long, outward-oriented ending. A simple Moravian Painted Ware culture (hereinafter referred to as MPWC) rondel in Němčičky...
considerably limits the possibility of detailed dating of human activities at the site. At least two phases of Neolithic occupation have been documented based on the character of the pottery mass, shape morphology and rim typology. Several thick-sided fragments of muddy pottery with a considerable organic admixture and without music-note decoration indicates occupation in the early phase of the Linear Pottery culture (hereinafter referred to as LBK). Besides closely undeterminable body sherds that can be categorised as coarse pottery, a base fragment with a lower part of a larger vessel (Fig. 8: 11), a round handle fragment and a partially damaged massive plastic application (Fig. 8: 10) can also be associated with this phase of occupation. The study of the spatial distribution of pottery dated to the LBK yielded interesting results: it occurred mainly in the NE part of the examined area (Fig. 7), overlapping with a small concentration of archaeological features predicted there based on geophysical surveys (Fig. 5). In the central part of the area of interest, there were several different pottery fragments of fine to medium-grained sandy mass and temper in the form of small stones. Several characteristic rim profiles (Fig. 8: 7–9) and the above-mentioned character of the pottery mass make it possible to date the second phase of Neolithic occupation to the MPWC or, more precisely, the Moravian – East-Austrian group (MOG), part of the Lengyel culture complex. Due to the absence of chronologically sensitive elements in pottery material, therefore, only general dating of Late Neolithic occupation is possible at present. Moreover, without a regular excavation, the surface MPWC finds cannot be linked to the time of the functioning of the rondel, even though their construction became a certain phenomenon during the Late Neolithic in multiple cultural milieus across a wide territory of Europe (e.g. Petrasch 1990; Trnka 1991; Podborský a kol. 1999; Kovárník 1997, 2004; Daim, Neugebauer Hrsg. 2005; Podborský, Kovárník 2006; Řídký 2011; Řídký et al. 2019, etc.), and a possible link would therefore offer itself.

Besides pottery, surface survey also yielded a smaller chipped stone assemblage comprising 13 artefacts. In terms of raw material, artefacts made of Jurassic silicate from the Cracow-Częstochowa Upland predominate. The presence of this material indicates long-distance contacts via the Upper Morava Valley to the Moravian Gate and further to Lesser Poland where its primary sources are situated (ca 220 km from Uherský Ostroh). As the material was used in the middle reaches of the Morava River throughout the Neolithic (Pavelčík 1998, 105; Vaškových 2006, 47, 80), the artefacts from Cracow-Częstochowa Jurassic silicate cannot be unambiguously assigned to any culture. However, a larger quantity of artefacts made of this material has been found in the area with the occurrence of LBK pottery. Another material imported from a large distance (ca 210 km) is radiolarite of Szentgát-type originating from NW Hungary, represented by a small trapeze (Fig. 8: 1). Based on the current state of knowledge of the distribution of radiolarites from the Bakony Mountains in Moravia (cf. Mateiuciová 2001a; 2001b; 2010; Vokač 2004; Bartík et al. 2022), finds from this material can be associated rather to the Early Neolithic occupation. Materials of regional and local provenance are less represented, including lower-quality cherts probably from local gravel (2 pc.) and red-brown radiolarite originating from the White Carpathians (2 pc.; ca 52 km), which was also widely used in eastern Moravia for the production of chipped artefacts by the bearers of both LBK and MPWC cultures (Vaškových 2006, 47, 80). The material of two artefacts could not be determined due to strong overburning and contact with fire was also documented on one flake of radiolarite (Fig. 8: 4).

From the perspective of dynamic classification of technological categories, the assemblage contains various forms of
preparation flakes (6 pc.) and their fragments, as well as finished products of extraction in the form of blades and their fragments (5 pc.). The tools were identified in five cases. Two end scrapers (Fig. 8: 5, 6) and a mesial fragment of a blade with lateral retouch (Fig. 8: 2) were made of from Cracow-Częstochowa Jurassic silicite. A small trapeze definable based on double-sided transverse oblique retouch is made of radiolarite of the Szentgál-type (Fig. 8: 1). The last tool is a damaged blade with bilateral retouch made of burnt silicite (Fig. 8: 3).

No polished stone artefacts have been identified, but several macrolithic artefacts made of local sedimentary rocks were determined, represented by a hand grinding stone and fragments or flakes of several more.

An important result of surface survey is the discovery that no finds from later phases of prehistory have been acquired, which, for the present, reduces the probability of dating the double circular complex near Uherský Ostroh to the Early Eneolithic or the Bronze Age. Unlike rondels of the MPWC Ia phase, however, the occurrence of rondeloids from these periods has been proved in eastern Moravia in the past (Pavelčík 1974; 1998, 2001a; Vaškových, Pavelčík 2000). Moreover, on the SW periphery of Uherský Brod, there was an Early Bronze Age (apparently fortification) system of triple arc-shaped ditches of the Věteřov culture (Geisler 2002). The absence of surface finds in the SE part of the examined area is somewhat peculiar, as geophysical prospection identified a larger quantity of potential archaeological features there.

5. Discussion

Several features of the double rondel from Uherský Ostroh seem atypical. Until an archaeological excavation is made, however, the solution of some unanswered questions will remain based only on hypotheses. One of the observable differences is represented by the character of the rondel’s geological subsoil. Unlike most ditch complexes in the Czech Republic, the rondel near Uherský Ostroh was not dug into preferred loess or loess loams (as almost 60% of rondels known so far are; cf. Kravciv 2019, 265–266), but into less often sought non-separated gravel of proluvial genetic origin passing into loose sand-clay or clay-sand sediments of Pleistocene origin. The non-distinct course of some parts in the SW segment of the inner ditch may be related to the character of the geological subsoil to a certain extent. Several possible explanations of this phenomenon exist. One of the causes may be that the ditch eroded very quickly after its construction and was filled with sediment identical to the one that comprises the subsoil. The hypothesis that the ditch was never completed cannot be excluded, either. This might have caused the above-mentioned fragmentary character of magnetic anomalies, which are broken into an interrupted line of several subsequent features especially near the SWW entrance (Fig. 5). Based on several sites from Lower Austria, already G. Trnka (1998, 41–48) considered the possibility that the ditches might have been made dug in independent sections by partial work groups and interconnected later.
The fact that the rondel near Uherský Ostroh might not have been completed may be related to the atypical ratio between the diameters of the outer and inner ditch. The diameter of the outer ditch oscillates between 104 and 105 m, while the inner ditch’s diameter (57 m) is only slightly larger than the outer ditch’s radius (Fig. 6). However, most Late Neolithic rondels have the ratio between the outer and the inner ditch of 3 : 2 or 4 : 3. The cases where the diameters of the two ditches follow a 2 : 1 ratio only occur in rondels that might have presumably been designed as triple ones, with a middle ditch in the annulus. Such a situation is considered, for instance, for a probably unfinished double rondel near Kamegg, Lower Austria. There, the diameter of outer ditch No. I reached 144 m and the diameter of inner ditch No. II 76 m. The SW part of outer ditch No. I consisted of six segments and the S to SE part of two sections (Trnka 1992; 1998, 42–44, Tab. 1, Fig. 1). The length of the individual parts varied between 8.8 m and 18.4 m, and the width between 1.2 and 1.5 m. Other not fully completed ditches are known, for example, from a simple rondel in Puch-Kleedorf near Rosenburg (Melichar, Neubauer Hrsg. 2010, 107, 237, Fig. 78a, Tab. 47–50), a double rondel near Kamegg (Melichar, Neubauer Hrsg. 2010, 105, 230, Fig. 76) and a probably unfinished triple rondel near Moosbiervaur (Melichar, Neubauer Hrsg. 2010, 108, 257, Fig. 78b, Tab. 61, 63–64). Unfinished outer ditches might possibly include also that of a rondel in Běhařovice cadastral area, Znojmo District, SW Moravia (Kovárník 1998; 1999a, 27, 29, Fig. 2–4, 6, Tab. 2: 2).

Besides the overall shape, the number and orientation of the supposed entrances might also be of fundamental importance in determining the age of the double rondel near Uherský Ostroh. The outer ditch has two and the inner ditch probably three entrances, according to an interpretation based on the evaluation of geomagnetic measurements. The outer ditch was interrupted by two simple entrances, in the NW and SEE direction (Fig. 6). The entrances in the inner ditch do not represent these directions, however; their orientations are different (NW, SSW, SE). These differences in the orientation of the entrances between the outer and the inner ditch cannot be explained by the prospective destruction of entrances in other directions, e.g. due to strong water erosion and subsequent cleaning and renovation of deformed ditches; no such information is available at present. Possibilities that cannot be ruled out include the origin of the individual circular ditches in different phases of occupation at the site or a purposeful intention of the authors, which, due to unknown specific requirements, did not follow the usual norms. It is evident, however, that a direction of entrances similar to that of the rondel near Uherský Ostroh cannot be found in any late Neolithic rondels known so far (cf. Trnka 2005). One of the possible explanations may also be other than Late Neolithic dating of the rondel. While surface surveys proved occupation from the earlier phase of the LBK at the site, no case of an area delimited by ditches of circular layout with a diameter of about 100 m are known from the Early Neolithic as yet. Dating of the
rondel to the Early Eneolithic or the Early Bronze Age is not corroborated much by the fact that surface surveys has not yielded any finds that would validate this possibility. A smaller part of the ceramic vessel fragment assemblage from the surface survey might be generally dated to the MPWC, without the specification of a particular chronological phase. A direct link between these finds and the rondel cannot be proved, however. The only indication may lie in their concentration within the ditch complex, in contrast to the LBK finds, which predominated in the N and NE parts of the area of interest (Fig. 7). The above-mentioned presumption of a superposition of some anomalies with the rondel ditches supports a multi-phase occupation at the site and might be related precisely to the LBK – MPWC (MOG) palimpsest. A secondary indicator of the cultural affiliation of the rondel might lie in the slightly wider width of the inner ditch which reaches up to 4 m, compared to the inner ditch whose maximum width does not exceed 3 m in most places. This phenomenon occurs above all in Late Neolithic rondels; in such cases, the wider inner ditch is described as the ‘main ditch’ (e.g. Melichar, Neubauer Hrsg. 2010, 96).

If the rondel near Uherský Ostroh really belonged to the Late Neolithic, it would considerably affect the current view of the occupation of the Uherské Hradiště region in the earlier phase of the MPWC (MOG). As most sites in the middle reaches of the Morava River belong to the later phase of the MPWC, it was generally presumed that more intensive colonization of SE Moravia did not take place until the MPWC IIa phase (Vaškových, Pavelčík 2000, 169; Vaškových 2006, 76–77). Sparse evidence of occupation in the earlier phase of the MPWC (Lengyel I) include finds from Uherské Hradiště – Mařatice, ‘Stanclova cihelna’ field, (Vaškových 2006, 156–157), Uherské Hradiště – Mikovice ‘Na Drahác’ field (Horsák 1942; Koštúřík 1982, 66), Tásov, ‘Čtvrťky’ field (Dohnal 1967; Vaškových 2006, 154) and apparently also some of the finds from the Staré Město – ‘Přední Kruhy’ field (Snášil 1981, 48), which was part of a larger polycultural complex situated on the so-called Velehrad Promontory (cf. Bartík, Chrasteck 2021). A unique find assemblage from feature No. 6 in Uherský Brod – Těšov (Pavelčík 1970–1971; Vaškových, Pavelčík 2000, 169, Fig. 3: 1–6; 4) is probably dated to the time between the earlier and the later phase of the MPWC. The assemblage includes thin-walled pottery with typical Lengyel profiles, accompanied by a decorated plate with a rugged rim and a part of a smaller vessel with an imitation of stroke decoration. The material from Těšov was interpreted as evidence of lively cultural contacts along the Morava River in the direction of the NE. The joint occurrence of a stroke ornament, the characteristic decoration of the Malice culture and the presence of MPWC pottery classes testify to a more complex situation in this region, where the individual cultural components might have influenced one another (Koštúřík 1996, 116).

The intensification of rescue excavations and the activity of amateur researchers have both led to an increase in the number of sites in the Uherské Hradiště District where the occupation might have begun already in the earlier phase of the MPWC. They include above all the sites Popovice – ‘Milonín’ (Kuča et al. 2010), Ostrôžská Lhota – ‘Chylické’ (Válek et al. 2012), Ostrôžská Nová Ves – ‘Koruny’ (Bartík 2019c) and Bílovice – ‘Padělky’; the latter, like Těšov, is the source of unique finds of a pottery with stroke decoration (Bartík 2018; 2019c; Bartík et al. 2017). In terms of relative chronology (Kazdová et al. 1994), regrettably, these sites only show general marks of the earlier phase of the MPWC, or possibly of the transition between the earlier and the later phase. Pottery reliably datable to the MPWC Ib phase has been identified only sporadically. Occupation of the MPWC Ia phase, which is crucial in terms of the occurrence of rondels (e.g. Podborský 1988, 123–147; 175–187; 277; Podborský a kol. 1999, 261; Daim, Neugebauer Hrsg. 2005, 14–15; Řídký 2011, 20, etc.), has not been unambiguously proved at any of the settlements. If such dating was proved for the site near Uherský Ostroh, it would be the very first in SE Moravia or, more precisely, in the area east of the Morava River. We need to add, however, that the Neolithic development in the middle reaches of the Morava River might have had its specifics, especially when taking into account the existing results of radiocarbon dating, which indicate an overlap of the Ia and Ib phases and make it possible to look for their real importance rather in regional differences and socioeconomic structures than in chronological succession (cf. Kuča et al. 2012; 2016; Trampota, Květina 2020; Chmielewski 2020).

So far, circular ditch complexes have only been known from the middle reaches of the Morava River from the later periods of prehistory. Rondeloids of Early Eneolithic age are represented above all by the irregularly circular or elliptical ditch from Uherský Brod – ‘Kýčkov’ with reported dimensions of 52 × 49 m (Pavelčík 2001a, 170, 173). The rondeloid has a 5 m wide entrance preserved on the SE side. The ditch was 4.5–5.1 m wide and 1.3–2.5 m deep (Pavelčík 1950; Pavelčík 1974; 1998; 2001a). The Uherský Brod – ‘Kýčkov’ complex is dated to the Epilengyel, which is borne by the Jordanów group in SE Moravia (Pavelčík 2001b). The dating of the ditch is stratigraphically corroborated by a superposition with a settlement pit of the classical phase III of the Baden culture (Pavelčík 1950, 51; Pavelčík 1998, 103).

Part (about one-third) of another irregularly round rondeloid with a diameter between 48 and 50 m was examined in 1964 on the eastern periphery of the built-up area of the municipality of Dolní Němčí. Administratively, however, the field is part of the cadastral area of neighbouring Vlčnov. The circular complex was 1.6 m wide, and its depth was between 0.29 and 1.46 m (Pavelčík 1998; Vaškových, Pavelčík 2000, 177, Fig. 5). No entrances to the complex were detected, but the author of the research presumes the existence of two entrances. A partial superposition of the ditch with the layout of a triserial above-ground structure dated to the Early Eneolithic was important for the dating of the rondeloid. The regular rectangular house had the dimensions of 27.36 × 3.22 m. According to Jiří Pavelčík, the ditch itself came into existence during the final development of the later phase of the MPWC (Pavelčík 1998, 104–105; Podborský a kol. 1999, 264–265).

The results of excavations of the two mentioned rondeloids from the final phase of the development of the MPWC (MOG) and the Epilengyel clearly documented that their ditches have flat bottoms of the ‘Sohlgraben’ type. This is in contrast with earlier Late Neolithic rondels, which have a pointed shape of the ‘Spitzgraben’ type. The knowledge of the type of the ditch bottom might therefore, help determine also the age of the rondel near Uherský Ostroh in the future.

For the sake of completeness, let us also mention that rondeloid building tradition survived into the Bronze Age. However, this is a typologically and apparently functionally different type of enclosure. Besides the above-mentioned ditch enclosure of the Věteřov group from Uherský Brod – ‘Katovky’, a partially examined triple ditch enclosure is also known from the Morava River basin from the Vřesovice – ‘Vřesovská’ field (Prostějov District). Based on the acquired pottery material, the enclosure can be dated to the Early Bronze Age Unetice Culture period (Daňhel et al. 2015; Fojtík et al. 2016; 2017). Since more similar structures are known from the wider area of Moravia, Slovakia and Lower Austria (e.g. Kovárník 1999b; Stuchlík, Stuchliková...
out at the site the following year confirmed the existence of a triple rondel from Oberschoderle, Lower Austria, which has a similar ratio between the size of the outer and the inner ditch (Trnka 1994). No Early Bronze Age finds have been acquired yet directly from the studied site in the ‘Padělky’ field, but sporadic evidence of human activities from this period, especially the Únětice culture, are known from several neighbouring fields in the Uherský Ostroh cadastral area (cf. Galuška 2000, 30–31; Vaškových, Menoušková 2005, 132–134).

6. Conclusion

A double rondel was discovered in Uherský Ostroh – ‘Kvačice – ‘Padělky’ field during the study of satellite images of the Earth’s surface in 2016. A magnetometric survey carried out at the site the following year confirmed the existence of two ditches predicted based on cropmarks. Besides the rondel, a larger quantity of anomalies, interpreted as potential archaeological features, were also identified in the examined area. Some showed signs of superposition, which indicated the probability of a multi-phase occupation at the site. In 2017–2020, the site was examined by surface survey with the support of GPS, which confirmed a polycultural character of the site. The results of surface surveys proved occupation from the earlier phase of the LBK and, only generally, from the MPWC (MOG) at the site. Apart from a collection of strongly fragmentary pottery, they also yielded a not very numerous assemblage of chipped artefacts made of local, but predominantly imported raw materials originating in S Poland, W Slovakia and NW Hungary.

The rondel near Uherský Ostroh represents the first double ditch complex in the area of the Lower Morava Valley in SE Moravia. It is situated on the boundary between an elevated plateau and a gentle SW slope near (ca 2.5 km) the confluence of the rivers Okluky and Morava. Possibly, the rondel was located close to the intersection of prehistoric routes, one passing through the Lower Morava Valley along the Morava River in the NE–SW axis and the other along the small Okluky River in the E–W axis towards the White Carpathians. The rondel’s ditches were dug into less often sought non-separated gravel of proluvial genetic origin passing into loose sand-clay or clay-sand sediments of Pleistocene origin, in contrast with the main trend preferring a loess subsoil.

The 2 : 1 ratio between the diameters of the outer and the inner ditch does not exclude the possibility that the whole complex might have originally been intended as a triple rondel. The question of the entrances is significant for double rondels. Except for the SSW entrance of the inner ditch, which has an indistinctive, orthogonally outwards oriented ending, all other entrances in both ditches have typologically simple, slightly fan-shaped ends of both faces of the ditch (e.g. Neubauer 2010, 92–93, Abb. 66: 1, 2). The two interpretable entrances in the outer ditch are oriented to the NW and SEE, while the presumed entrances in the outer and inner ditch show disharmony and are not mutually aligned. A change in the conception of the entrance orientation between the two ditches is visible here; the question is what caused it. Most multiple one-phase Late Neolithic rondels have the same number and orientation of the entrances in all ditches. This circumstance would not rule out different times of origin of the two circular ditches or the possibility that they were not used at the same time. Another possibility we cannot exclude is a later dating of the rondel to the Early Eneolithic or the Early Bronze Age, even though surface surveys at the site has not yielded any finds from these periods yet. The existence of rondeloids in Uherský Brod – ‘Kyčkov’ and Vlčnov might indicate that the tradition of building monumental complexes delimited by circular ditches might have survived longer in SE Moravia and lasted at least from the later phase of the MPWC (MOG) possibly until the end of the Early Bronze Age. On the other hand, our contemplation is complicated by the concentricity of the two ditches. It might indicate either that the ditches were contemporaneous or, at least, that the builders of the second ditch respected the still visible course of the first one.

The discovery of a double rondel near Uherský Ostroh has shed new light on the research of socio-cultic architecture in SE Moravia and raised a number of questions. A precondition for answering them is to precisely date the rondel or the individual ditches. However, this will only be made possible by future excavations in the field.

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References


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**Non-destructive research of a double circular enclosure at Uherský Ostroh (Uherské Hradiště District, Czech Republic)**

**Přehled výzkumů 64/2, 2023 ● ACCEPTED MANUSCRIPT / IN PRESS**


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**Resumé**

V roce 2016 objevil při studiu satelitních snímků zemského povrchu hlavní autor článku dvojitý rondel ve poloze Uherský Ostroh – Kvačice – „Padělky“. V následujícím roce proběhl na lokalitě geofyzikální průzkum (Tirpák 2017), který potvrdil existenci dvou příkopů predikovaných na základě vegetačních příznaků. Kromě rondelu bylo na zkoumané ploše o rozloze 150 x 150 m identifikováno i větší množství anomalí, které mohou být interpretovány jako potenciální zahoubené objekty. Někteří z nich vykazovaly znaky superpozice, což naznačovalo pravděpodobnost vícefázového osídlení lokality. Mezi lety 2017–2020 byla lokalita zkoumána formou povrchových sbírů s podporou GPS (pozice každého identifikovaného artefaktu byla zaměřována), která potvrdila existenci dvou příkopů predikovaných na základě vegetačního osídlení ze středního neolitu s lineární keramikou a pouze rámcové období kultury s moravskou malovanou keramikou. Vyjma kolekce silně fragmentarizované keramiky se podařilo získat i nepočetný soubor štipcové industrie zhotovené z lokálních, ale především z importovaných surovin původu z jižního Polska, západního Slovenska a severozápadního Maďarska.

Rondel u Uherského Ostrohu představuje první dvojitý příkopový areál v oblasti Dolnomoravského úvalu na jihovýchod Moravě. Situován je na rozhraní vyvýšené plošiny a mírného jihozápadního svahu nedaleko (cca 2,5 km) od soutoku potoka Okluky s řekou Moravou. Je možné, že se rondel nacházelo v blízkosti krápníků ve Východní Moravě. Situován je na rozhraní ve fazi vývoji eneolitu na jihovýchodní Moravě. Situován je na rozhraní přízemního kruhového areálu v blízkosti kultury s lineární keramikou a pouze rámcové období kultury s malovanou keramikou. Je možné, že se rondel nacházelo v blízkosti krápníků ve Východní Moravě. Situován je na rozhraní přízemního kruhového areálu v blízkosti kultury s lineární keramikou a pouze rámcové období kultury s malovanou keramikou. Je možné, že se rondel nacházelo v blízkosti krápníků ve Východní Moravě. Situován je na rozhraní přízemního kruhového areálu v blízkosti kultury s lineární keramikou a pouze rámcové období kultury s malovanou keramikou. Je možné, že se rondel nacházelo v blízkosti krápníků ve Východní Moravě.
vchody nasměrované k JV, JJJZ a SZZ. Dva z hypotetických vstupů (JV a SZZ) jsou téměř protilehlé a vůči třetímu JJJZ vstupu svírají úhel okolo 85°. Nejlépe patrný je JV vstup, kde přerušení průběhu příkopu dosahuje 2,7 m.