

Ewa Anna Lisowska<sup>1</sup>, Sylwia Rodak<sup>2</sup>

## A HILLFORT COMPLEX IN MYŚLIBÓRZ IN THE SUDETY MOUNTAINS

### ABSTRACT

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The Myślubórz Gorge, located within the Kaczawy Foothills, is well-known to environmentalists and scholars studying the past. The investigations launched in the 1990s made it possible to determine the chronology of three of the archaeological sites in this area. In 2018, two hillforts – on the Kobylica and Golica hills – were investigated. Czech literature classifies such hillforts as the *ostrożna*-type. The excavations of these hillforts made it possible to establish to date them between the 9th and 10th centuries.

The hillforts were located on hilltops with similar altitudes above the sea level, less than 200 m from each other. Such a spatial arrangement made it possible to control the gateway to the Myślubórz Gorge from the north-east. Reasons for developing a defensive system in the southern part of the gorge are obscure, as is the role that two other early medieval hillforts played in it. Was it simply a warning system, or rather part of a comprehensive network of defensive sites?

Keywords: Early Middle Ages, hillforts, mountain archaeology, Sudetes, blacksmith production, landscape archaeology

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<sup>1</sup> Institute of Archaeology Wrocław University, Szewska st. 48, 50-137 Wrocław, Poland; ewaliskamail@gmail.com; <https://orcid.org/0000-0002-0444-9513>

<sup>2</sup> Independent researcher, Wrocław, Poland; sylrod@poczta.onet.pl; <https://orcid.org/0000-0003-0321-834X>

## 1. INTRODUCTION

Early medieval hillforts are an inherent element of the archaeological landscape in the Sudetes. Located in their lower parts – the Sudety Foothills and the Lusatian Highlands – these hillforts once constituted a defensive system with a complex network of mutual connections. The Myślíbórz Gorge and its direct neighbourhood are of particularly high analytical value in studies of the early medieval defensive structures. The archaeological excavations conducted in June 2018 aimed to shed more light on these objects, which were not previously investigated at a significant scale. The main objectives were to verify the chronology of the structures and examine their defensive features.

The Myślíbórz Gorge is situated in the eastern part of the Kaczawy Foothills, within a micro-region named Chelmy or the Złotoryja Foothills. The area is part of the Western Sudetes Foreland. The bedrock consists of rocks genetically associated with the Kaczawa metamorphic unit (Paleozoic greenschist slates, greenschists, diabases and phyllites) and the Neogene basalts visible in a few places as particularly appealing columns (Baranowski *et al.* 1998; Kowalski 1978; Migoń 1999). The latitudinally orientated bed of the Jawornik River constitutes the axis of the gorge. The local geomorphological landscape also features numerous rock promontories and outliers. The area is part of the Chelmy Landscape Park and has been a nature reserve since 1962. The sites with hart's-tongue fern are under special protection (Wiśniewski and Horoszko 2013; Łaborewicz *et al.* 2010, 55).

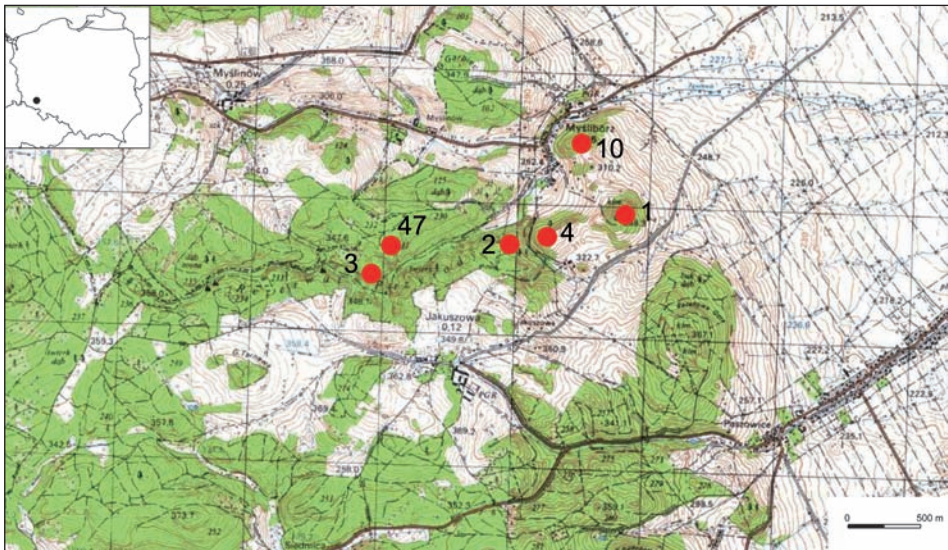


Fig. 1. Wąwóz Myślíbórz, Jawornik district. Location of archaeological sites mentioned in the paper (produced by E. Lisowska, on the background of a topographic map)

So far, the area has yielded as many as five defensive sites and one burial mound cemetery. The first site, Skalki (AZP sheet 81-20, no. 10 in the village), lies closest to Myślubórz (ca. 300 m away) on a hill overlooking the village from the east. Another defensive site on the Rataj hill (AZP sheet 81-20, no. 1 in the village) is situated ca. 600 m south-east of the village and ca. 600 m east of the Jawornik River valley. In the central part of the Myślubórz Gorge, defensive structures were raised on the Golica (AZP sheet 81-20, no. 2 in the village) and Kobylica (AZP sheet 81-20, no. 4 in the village) hills. The hills overlook the valley, where a small gorge of the Kobylica stream joins it. They were built on rocky promontories ca. 600 m south-west of Myślubórz. In the southern part of the Jawornik River valley, ca. 1.5 km south-west of the village, another defensive site was identified (AZP sheet 81-19, no. 3 in the village). Since the hill does not have any geographic name, we shall use the term used before World War II: *Schanzberg* (The archives cite both the name *Schanzberg* and *Schweden Schanzen*. In this text, we used the shorter term). Approximately 300 m north-east of this site, on elevated terrain on the other side of the gorge, a burial mound cemetery was located (AZP sheet 81-19, no. 47 in the village; Fig. 5).

## 2. THE STATE OF ARCHAEOLOGICAL RESEARCH IN THE MYŚLIBÓRZ AREA

Historians and archaeologists were already familiar with the defensive sites in the Myślubórz Gorge in the 19<sup>th</sup> century (Knie 1845, 533; Drescher 1866/67, 78; Schuster 1869, 107; Zimmermann 1874, 210; Behla 1888, 172). In the final part of this century, information files were made for hillfort no. 1 on the Rataj Hill, no. 2 on the Golica hill, and no. 3 (*Schanzberg*). The files included a brief description of the terrain (Fig. 2), the exact locations and sizes of the enclosures, and references to the literature, which was quite modest that the time (State Archives in Wrocław, Provincial Government Department in Silesia, sign. 716; Archeological Museum, Branch of the Wrocław City Museum, Scientific Documentation Department-Research Archives: DzDN-AN, sign. MA/A/114, unnumbered page – MBL. Kolbnitz; sign. MA/A/149, p. 6; sign. MA/A/278; sign. MA/A/286; sign. MA/A/291; sign. MA/A/292; sign. MA/A/379; sign. MA/A/394c; sign. MA/A/465b, p. 96; sign. MA/A/no number). An analysis of the above plans shows that the sites were often incorrectly marked on the archival *Messtischblatt* maps. The descriptions often refer to the neighbouring hillforts and locations. It is difficult to identify the reasons behind over a dozen discrepancies concerning the forms, locations, and locally used names of the hills featuring the defensive objects (Figs 2 and 3). The errors remained unaltered in the post-war period, so much of the research was probably based on inaccurate archival documentation.

The hillfort/castle on Rataj hill (site no. 1) was the first investigated. The descriptions of its original form and size are difficult to verify, since a later basalt quarry destroyed it

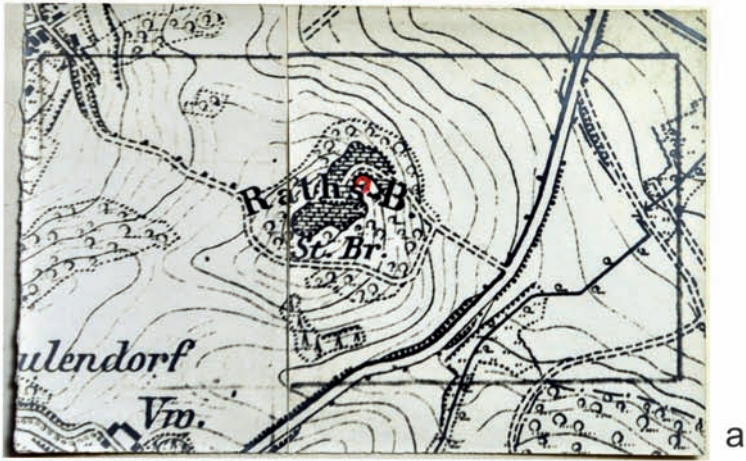
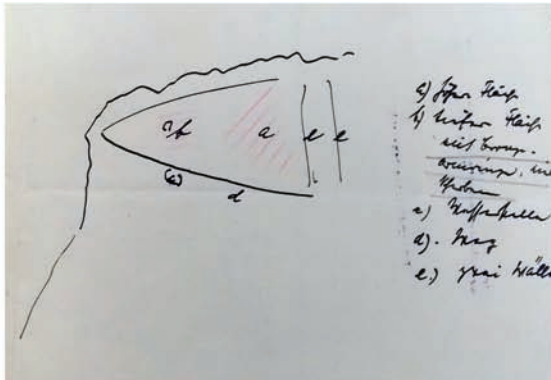


Fig. 2. Myślubórz, Jawor district. Documentation made before 1945.  
 a – site no. 1 on Rataj hill; b – erroneously marked outline of the ramparts on Golica hill  
 (Archives of the Archaeological Museum in Wrocław)





a



b



c

<b>Kreis</b> Jawor	<b>Reg.-Bez.</b> Liegnitz	<b>Gemarkung</b> Matzdorf	<b>Ergebnis:</b>
<b>Flurname</b>		<b>Gemeinde</b> A. d. 1. Aug. 1900	36
<b>Name der Wehranlage</b> Kymatenpfanne Gausenberg		<b>Gemeindet durch:</b>	
<b>Molltechblatt Nr.</b> 2556	<b>Karte 1:</b> 100000 Nr. 422	<b>Bearbeitet durch:</b>	
<b>Lage zum Ort:</b> 6 km südlich der Forsterei am Gausenberg		<b>Ungefähre Lageskizze:</b> Topographische Karte	
<b>Lage im Gelände:</b> Westlich d. Matzdorfer Gausenberg			
<b>Art der Befestigung:</b> (Ringwall, Abschnittswall, mehrere Parallelwälle, Ringwall, Abschn. Mauerwälle, Langwalle, Gräben usw.)		<b>365</b> 1:10000	
<b>Ungefähre Größe:</b> Abstand der höchsten Wälle etwa 100m		<b>Geschichtlich erwähnt?</b>	
<b>Besonderheiten:</b> (Tore, Brücken, Zugangsdämme, Vorburg, zugehörige Siedelungen und Gräberfelder usw.)			
<b>Bauart der Wälle:</b> felsensteil			
<b>Erhaltung:</b> unregelmäßig	<b>Nutzung:</b> Wald		
<b>Besitzer:</b> Rittergut Matzdorf			

d

Fig. 3. Myślubórz, Jawor district. Documentation made before 1945.

a – schematic outline of the ramparts and location of the finds at site no. 3; b – sketch of the rampart fortifications at site no. 3; c – location of site no. 3; d – information file for site no. 3 from the so-called Max Hellmich Atlas with the erroneously marked rampart outline (Archives of the Archaeological Museum in Wrocław; State Archives in Wrocław, Provincial Government Department in Silesia)

almost completely. The situation is different at sites 2 and 4. The form of the ramparts indicated on the map for the site of Myślubórz 2 (on Golica hill) did not match the real form. According to the German investigations, the embankment enclosing the area on the rocky promontory had an additional, perpendicularly orientated section enclosing the space outside of the hillfort. Such structures do exist within the neighbouring hillfort – located on Kobylica hill and marked as site no. 4. It is possible that the authors of the old documentation confused the sites and illustrated the plan of the Golica hillfort with the outline of the ramparts from the neighbouring Kobylica (Fig. 2). This assumption rests on two premises. First, for over 100 years, no documented activities which could change the morphology of the ramparts have taken place on the hills. Second, such an arrangement is relatively rare: in Silesia it is identified only at this one site.

Also, the archival documentation available for hillfort no. 3 (*Schanzberg*), located on the northern side of the Jawornik River valley, is incorrect. The actual SW-NE orientation of the ramparts appears to be close to S-N, and they were drawn too far from the valley bottom (Fig. 3). It is worth mentioning that in 1881, the Museum of Silesian Antiquities



Fig. 4. Map made before 1945 with the distribution of archaeological sites in the Myślubórz area. Marked sites 1, 2, 3. Sites 4 and 10 marked with a pencil with no number indicated (Archives of the Archaeological Museum in Wrocław)

(Museum Schlesischer Altertümmer) acquired seven iron bowls, which – according to most of the scholars – were found at this site (Rzeźnik 2006, 193). Only, the erroneous description by Hans Seger indicated that they were found on Rataj hill (Seger 1928, 143).

In the years 1918-1932, Max Hellmich conducted surface surveys and made information cards for three hillforts located in the analysed area (Myślubórz site no. 1; site no. 2; site no. 3). The scholar published his list in the paper *Schlesische Wehranlagen* (Hellmich 1930, 44). Although Max Hellmich was considered a brilliant cartographer, he used the earlier, erroneous drawings. Thus, he maintained the incorrect information on the rampart arrangement at site nos. 2 and 3. The analysis of the map preserved in the Archives of the Archaeological Museum in Wrocław reveals one more interesting fact, which might explain the previous mistakes. Apart from the three sites marked in red (Myślubórz sites 1, 2 and 3), the map features three pencil-drawn circles in places where sites 4 and 10 are situated (Fig. 4). Therefore, all of the objects were most probably identified before 1945, but the exceptionally diversified morphology of the area confused the investigators. For instance, the description of the Rataj hillfort indicates its location on the hilltop named *Kuchenberg* – a former name of Skalka hill, where site 10 is situated. Such mistakes remained unverified in the documentation made at the end of the 1950s (archives of the Provincial Office of Monument Protection in Legnica).

The available documentation originating from before 1945 indicates that:

1. None of the hillforts were excavated and, therefore, full information on the chronology of the sites was not available.
2. Three (Myślubórz sites 1, 2 and 3) had information files and maps; for two of them the outlines of the ramparts were erroneously marked – sites 2 and 4 were confused.
3. Site no. 3 yielded seven iron bowls of the Silesian type.
4. The chronology of the sites was generally determined as medieval.
5. The scholars most probably had knowledge of all of the sites.
6. Selected finds and a spring coming out from the foot of the hillfort at site no. 3 appeared on a hand-sketched plan.
7. German scholars did not record the existence of the burial mound cemetery (most probably they were not aware of it).

In 1959 and 1966, Tadeusz Kaletyn, the Provincial Officer for the Preservation of Archaeological Monuments, initiated surface surveys at the discussed sites. The investigations were able to establish the approximate chronology of the hillforts (Kaletyn 1968, 290; Kaletynowicz and Lodowski 1968, 99-101; Lodowski 1980, 100; Prus 2007, 81-82). Site no. 1, located on the top of Rataj hill, was dated between the 14<sup>th</sup> and 15<sup>th</sup> centuries; site no. 2, on the rocky promontory locally named Golica, was generally described as medieval; and, site no. 3, situated on the slope of a nameless promontory (earlier *Schanzberg*) deep in the Myślubórz Gorge, was thought to be possibly early medieval. After the war, two objects from the Myślubórz area also appeared in the catalogue by Włodzimierz Antoniewicz and Zofia Wartołowska (1964).



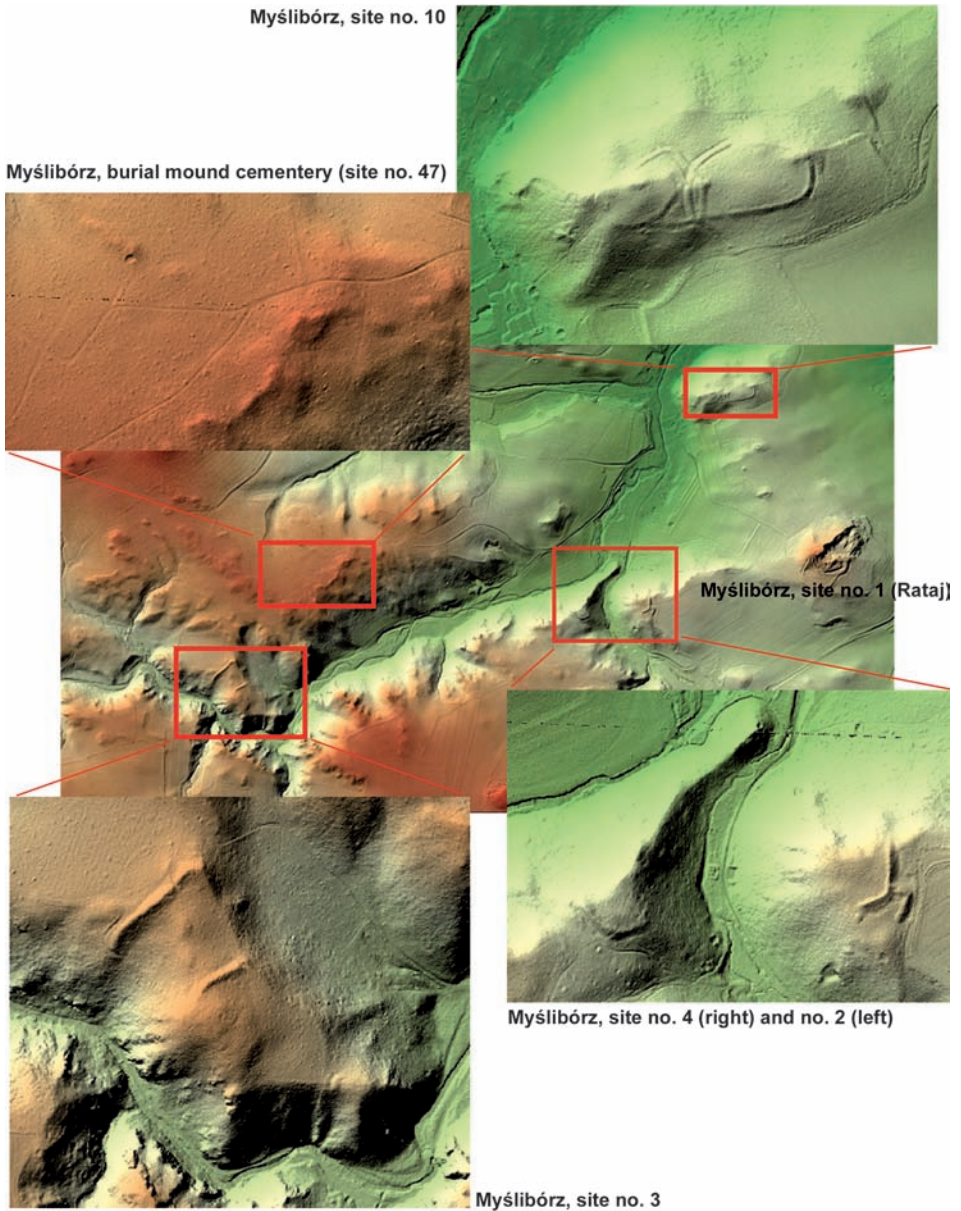


Fig. 5. Digital terrain model of the Myślubórz Gorge area with sites discussed in the paper (produced by E. Lisowska and M. Mackiewicz)





Fig. 6. Myślubórz, Jawor district, site no. 10. Selected 9<sup>th</sup>-10<sup>th</sup>-century pottery found in 1994 (collection of the Institute of Archaeology, University of Wrocław) (photo by E. Lisowska)

Further research on the function and chronology of the structures in Myślubórz Gorge was conducted in the years 1994-1997. In 1994, the Sudety Research Group, including Artur Boguszewicz, Jarosław Bronowicki, Aleksander Limisiewicz and Andrzej Wiśniewski, launched surface surveys and small-scale test excavations on a few sites in the Myślubórz, Paszowice and Chelmiec areas. The investigations resulted in the identification of several new sites, including a burial mound cemetery (Myślubórz, site no. 13) and the hillfort on the top of Skalka hill (marked in the AZP as Myślubórz, site no. 10). Although the team marked this hillfort as new, it is present in the pre-war and 1950s documentation. At that time, however, it was often confused with the site on Rataj hill. As a result, it was not entered into the register of archaeological monuments. Four of the hillforts (Myślubórz, sites 1, 4 and 10) and the burial mound cemetery were investigated with test trenches and full-scale excavations (Boguszewicz 1994; Jarysz 1997; Jarysz and Limisiewicz 1998), which allowed for a more precise chronology of the sites to be determined (Fig. 5). Discovering Bronze and Early Iron Age layers with early medieval (9<sup>th</sup>-10<sup>th</sup> century) pottery sherds at

site no. 3 was a great surprise. The ten test trenches made it possible to partially investigate the structure of the ramparts, as well as a dwelling house containing pottery sherds characteristic of the Lusatian culture. The acquired material originated mostly in the Late Bronze and possibly Early Iron Age. According to the hypothesis of Radosław Jarysz, the object might have been built at the end of the Bronze Age (Lusatian culture) and briefly used in the Early Middle Ages (8<sup>th</sup>?-10<sup>th</sup> centuries: Jarysz 1997, 166). A similar situation occurred at the burial mound cemetery, where – apart from the Lusatian culture pottery sherds – a few sherds with early medieval features were identified. Out of the four investigated mounds, one yielded some 9<sup>th</sup>-10<sup>th</sup>-century pottery sherds and the other, Lusatian culture materials. Since only a fragment of the cemetery was investigated, it was difficult to determine the chronology of the particular graves (prehistoric or early medieval). Three out of the four investigated mounds contained stone structures. Two (nos. 4 and 2) had a quadrangular stone nucleus oriented according to the cardinal directions, which might help establish their dating. Mounds incorporating this type of stone structure are characteristic of the Slavic cremation burial custom and classified as type IIIC (Zoll-Adamikowa 1979, 103-115). In the few Lusatian culture mounds, no such structures were recorded, which is chronologically significant (Malinowski 1961).

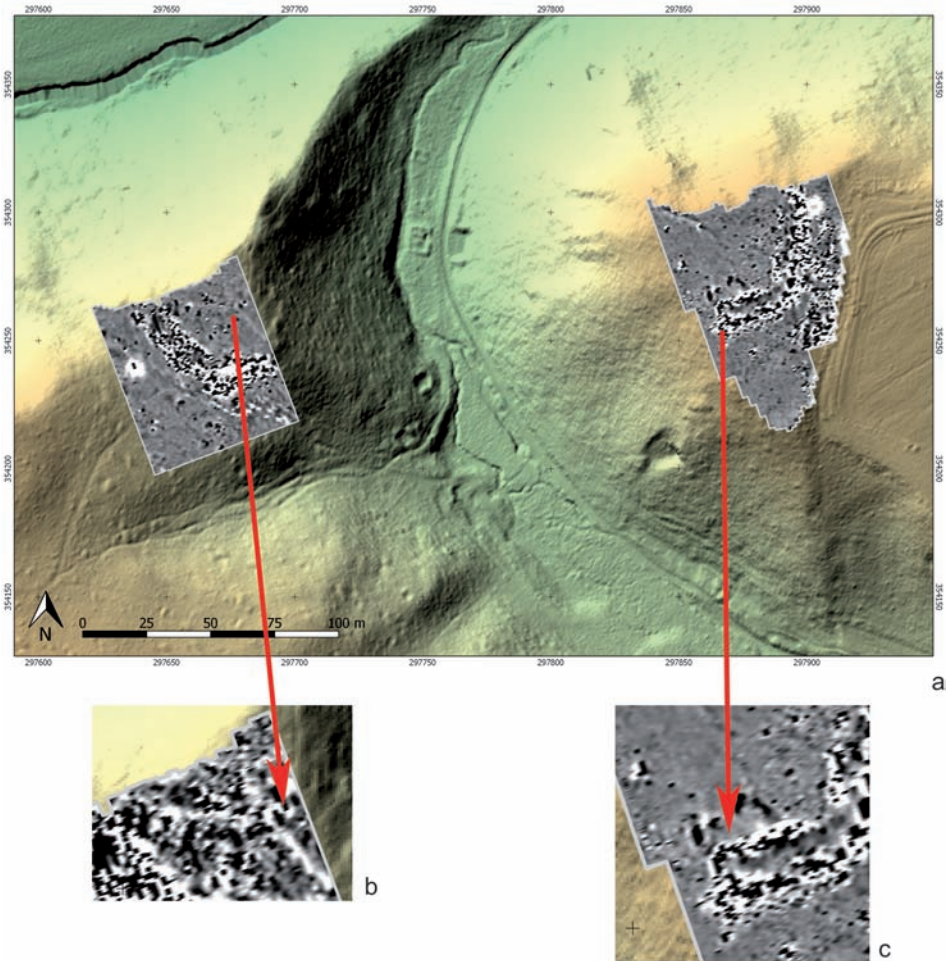
In 1994, the research group also investigated the newly discovered site no. 10, located on the top of Skalka hill, overlooking the village of Myślubórz from the east. The archaeologists, led by Artur Boguszewicz, made a 1 × 1 m trench (in the northern part, at the base of the inner side of the rampart), which yielded ten pottery sherds, dated by Paweł Rzeźnik between the 9<sup>th</sup> and 10<sup>th</sup> centuries (Fig. 6).

After 1997, no excavations took place in the Myślubórz Gorge area. The local people state that various items of probably prehistoric and medieval origin are being found in the area of Myślubórz and Jakuszowa.

### 3. THE INVESTIGATIONS OF THE KOBYLICA AND GOLICA HILLFORTS IN 2018

These two sites overlook the mouth of a small gorge in which the Kobylca stream flows. The excavations aimed to establish their precise chronology and examine their inner layout and the relationship between them. Additionally, samples for environmental and soil analyses were taken. A magnetometer survey, conducted by Maksym Mackiewicz, Maciej Ehlert and Bałomiej Myślecki from the Archeolodzy.org foundation (Mackiewicz *et al.* 2018; Mackiewicz *et al.* 2018a), preceded the excavations. The survey made it possible to select a few promising areas with magnetic anomalies (Mackiewicz and Myślecki 2014; 2015; Sikora *et al.* 2015; Schmidt 2015), which might accompany archaeological features (Fig. 7: a). The area, surveyed with a Bartington Grad-601-2 fluxgate gradiometer, occupied 0.47 ha on Kobylca hill and 0.39 ha on Golica hill. The most distinctive bipolar

anomalies, reaching up to the  $-50/+50$  nT range (in some of the places even up to 100 nT), occurred on the rampart lines. Anomalies visible at the ends of the embankments indicate that the locations where the structures ended. Therefore, we might assume that the rampart outlines were preserved completely, and their terminal parts did not slide down the slope (Fig. 7: c). In some of the measurements, high deviations might have been caused by the presence of rubble consisting of strongly magnetic basalts. At both sites, the distribution of the positive and negative anomalies, suggesting the presence of archaeological features, was irregular. Only features 1 and 2, recorded on Golica hill, were identified with



**Fig. 7.** Examples of magnetic anomalies recorded on sites no. 2 and no. 4 in Myślubórz. a – measurement area; b – anomalies showing the outline of the end of the rampart at site no. 4; c – linear anomaly within site no. 2 (produced by M. Mackiewicz and E. Lisowska)



the magnetometric survey. Other trenches situated on the visible anomalies did not bring satisfying results. Moreover, the Golica hillfort yielded a linear anomaly, which might indicate the existence of a small ditch dividing the courtyard of the hillfort (Fig. 7: b).

### 3.1. The investigations of the Kobylica hillfort

The hillfort, marked in the records as site no. 4 in Myślubórz, is located on the top of Kobylica hill (330,2 m a.s.l.), overlooking the Jawornik River valley. Its shape is irregular and the courtyard is located on a steeply ended promontory, enclosed with a semicircular, 65-metre long rampart. Additionally, the rampart had a branch on its outer side. The outline of the branch was rectangular, with one open end from which the hillfort could be accessed (Fig. 8). The total length of this part of the embankment was 37 m. The first line of the ramparts enclosed an area of 1200 m<sup>2</sup>. If we include the 200 m<sup>2</sup> behind the second

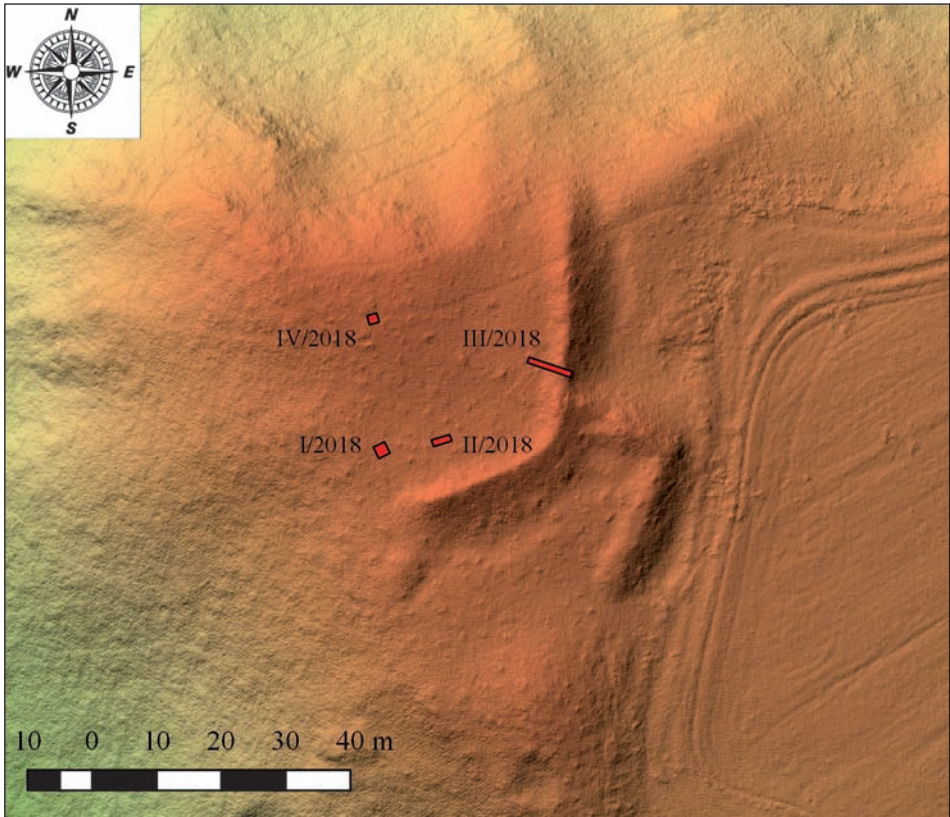


Fig. 8. Myślubórz, Jawor district, site no. 4. Digital terrain model of the hillfort's defensive features and distribution of excavation trenches in 2018 (produced by S. Rodak)

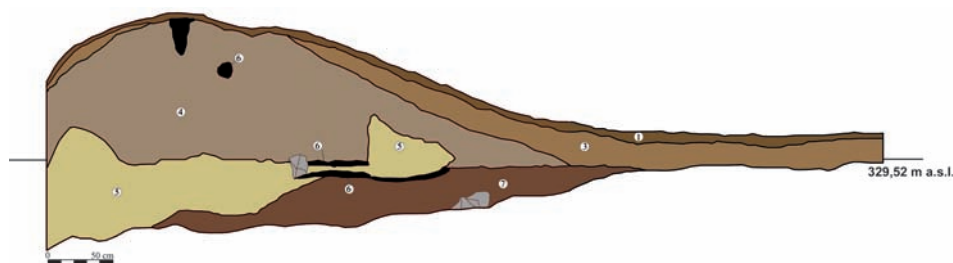
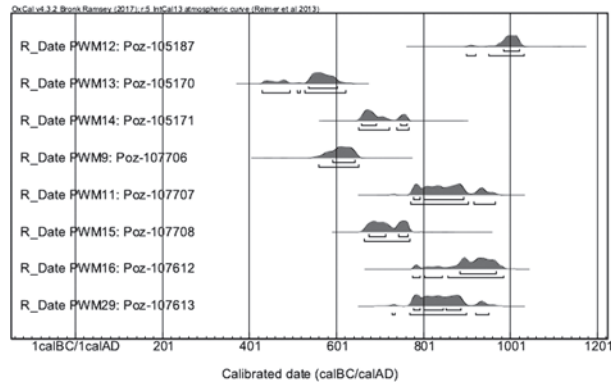


Fig. 9. Myślíbórz, Jawor district, site no. 4. Cross-section of the rampart in trench no. III/2018 (produced by E. Lisowska and S. Rodak)

line of the ramparts, the whole structure had an area of 1400 m<sup>2</sup>. The excavators made four trenches – three inside of the hillfort and one that cut across the rampart (Fig. 8). No archaeological features interpreted as buildings or settlement structures, or testifying to household or production activities were recorded inside of the hillfort. Directly under the layer of forest litter, a weathered yellow rock was unearthed. Its top layer included mostly medium- and fine-grained fractions, while the bottom layer, immediately above the solid rock, included a large number of sharp-edged, small rock fragments. Only the trench cutting the rampart yielded – besides the already mentioned layers – a few-centimetre thick layer of brownish soil immediately under the forest litter. It was visible along a length of 1.5 m on the inner side of the embankment. The layer produced ten pottery sherds. The trenches on Kobylica hill had a total area of 15.25 m<sup>2</sup> and yielded 20 early medieval pottery sherds, including so-called smooth pottery (Pankiewicz 2012, 91-92). Besides the broken vessels, in trench I/2018, 20 cm below the surface, a flint flake was found. A similar number of sherds (21) and bird bones were found in a small trench (1 × 1 × 0.6 m), located in the northern part of the hillfort in 1994 (personal communication with Artur Boguszewicz). Such a disproportion between the quantity of the acquired material and the area of the trench might indicate that the potential human activities took place mostly in the northern part of the site – not investigated in 2018. The magnetic anomalies in the southern part of the site might have possibly resulted from the magnetism of the volcanic rocks. In trenches from 2018, such rocks occurred close to the surface – immediately under the layers of the topsoil and the weathered rock (up to 40 cm).

Trench III/2018, cutting the rampart in the eastern part of the site, provided much more interesting data (Fig. 9). Its size was 1 × 6 m. Under the 5-centimetre layer of topsoil/forest litter (layer no. 1), on the inner and outer side of the rampart, a dark brown, layer (between 1 and 20 cm thick) with small, sharp-grained stones was found (layer no. 3). A very compact, slightly lighter, brown-yellowish layer with very numerous sharp-grained stones was immediately beneath it (layer no. 4). Their stratigraphic relation indicated that the material flowing down the rampart formed layer no. 3, while layer no. 4 was the original fill of the earth-and-stone rampart. On its top, fragments of a vertically oriented, burnt



**Fig. 10.** AMS results of charcoal samples from sites 2 and 4. PWM 12, PWM 13, PWM 14 – samples taken from the rampart of site no. 4, PWM 9, PWM 9, PWM, 11, PWM, 15, PWM, 16, PWM 29 – samples taken from trench no. I/2018 at site no. 2 (produced by M. Furmanek)

structure of wood (oak and hornbeam) were found. Under the compact soil with stones (layer no. 4), there was a light-yellow, clay-dust layer with a saddle-shaped section (layer no. 5). Below it, a burnt layer, 5-10 centimetres thick, was found (layer no. 6) on top of loose, dark brown gravel (layer no. 7). Among the charcoal pieces, only specimens of oak were identified (Sady 2019, 24-25). Furthermore, in the top stratum of the clay layer (no. 5) a grey-shaded area with a few charcoal fragments was observed, which might indicate the presence of additional wooden fortifications. The examined structure matches the WIIB type of rampart according to Jacek Poleski's classification (Poleski 2004, 125-126). This type includes ramparts in the form of earthworks with a trapezoidal or triangular section, and a palisade or other structure resting on poles arranged in a line, a few metres from one another. Such ramparts occurred in the 8<sup>th</sup> and 9<sup>th</sup> centuries in Moravia (Procházka 1990; Galuška 1998). Until the end of the 10<sup>th</sup> century, they were also present in Greater and Lesser Poland (Hilczerówna 1967, 158-161; Poleski 2004, 125). However, the Silesian examples have not been thoroughly investigated (Jaworski 2005). A similar structure occurred in the damaged ramparts of the hillfort in Witostowice, in the Strzelin Hills (Moździoch 1984, 182). The cross-section of the Witostowice rampart included a layer of light clay with pieces of charcoal. It is thicker on the outer and inner sides of the rampart than in the centre (compare also Jaworski 2005, 171-173). The Witostowice rampart most likely had a stone facing; the stones are now scattered (Jaworski 2005, 172). Despite the structural similarities, the facing makes it different from the Kobylica earthworks.

The investigated remains of the rampart might give us some clues as to the building process. The first step was most probably levelling the surface around the hilltop with gravel (layer no. 7), which was later covered with oak branches or strewn with glowing charcoal for depuration. On such ground, the alleged outer and inner wooden structure



was placed and fixed with the clay-dust layer. The remaining space was filled with soil and small stones. An additional wooden fortification, resting on vertical poles spaced a few metres from one another, was most likely placed on top of the rampart.

The C14 analyses, conducted in Poznań using the AMS method, utilised three charcoal samples. The results were ambiguous, but indicated that the rampart had been built generally in the Early Middle Ages (Fig. 10). The results were calibrated with the OxCal v4.2.3 software (Reimer *et al.* 2013).

### 3.2. The investigations of the Golica hillfort

The other investigated site was the hillfort located on the top of Golica (340 m a.s.l.), less than 200 m from site no. 4, as the crow flies. It has been previously discussed in the literature and dated to the Early Middle Ages (Jaworski 2005, 61). As in the other hillfort, a high rampart encloses its courtyard, located on the edge of a rocky promontory (Fig. 11).

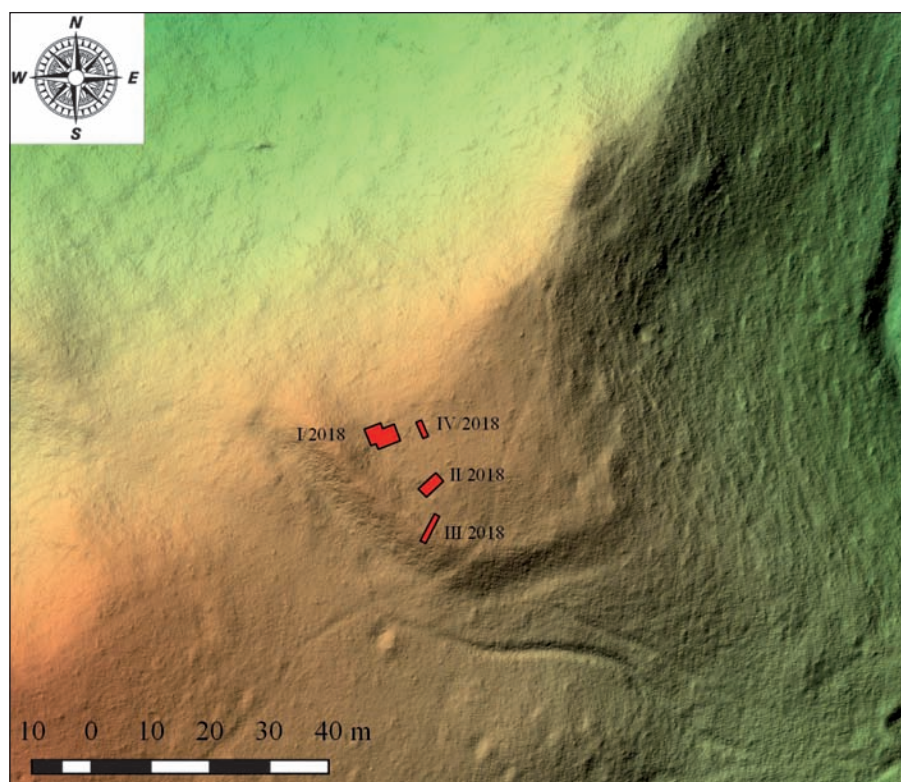


Fig. 11. Myślubórz, Jawor district, site no. 2. Digital terrain model of the hillfort's rampart outline and distribution of excavation trenches in 2018 (produced by A. Mikołajczyk)

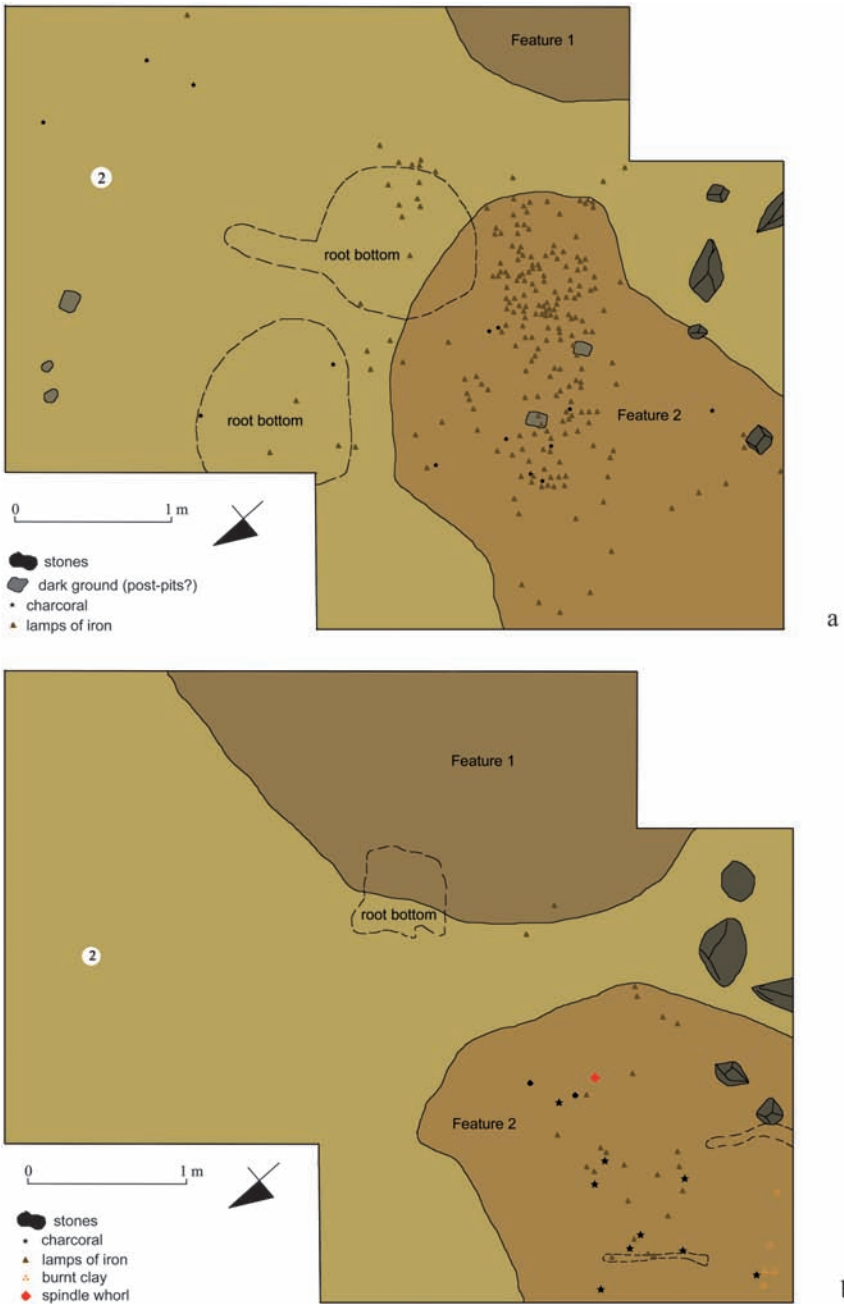


Fig. 12. Myslibórz, Jawor district, site no. 2. Trench I/2018 with features and distribution of slag and charcoal pieces. a – planum 15 cm below the ground; b – planum 25 cm below the ground (produced by E. Lisowska)

The semicircular embankment is 64 metres long and encloses a space of 11,200 m<sup>2</sup>. On its outer side, there is a small, dry moat, which is very apparent in the western part of the site and disappearing towards the east. It was dug most probably during the construction of the rampart. Close by the outer side of the embankment is a funnel-shaped pit with a 14-metre-long ditch descending towards the bottom of the Kobylica River valley. The function of this complex is unknown. Nor do we know whether the structure might be associated with production/household activities in the vicinity of the hillfort in the Early Middle Ages.

Three excavation trenches were made inside of the hillfort in the places where magnetic anomalies occurred (Fig. 11), which was in the western part of the site, close to the rampart. As in the Kobylica hillfort, one of the trenches cut through the rampart and allowed for the examination of its structure. The trenches in the courtyard yielded three archaeological features. Feature 2, discovered in trench I/2018, produced the most exciting finds. The excavated portion was oblong, parallel to the rampart and measured 2-2.5 × 3 metres (Fig. 12: a, b). A massive tree root damaged the eastern part of the feature. The finds included over 200 pieces of iron slag, of which 197 did not exceed 1 cm, and 11 were 3-6 cm. Larger lumps of slag were concentrated in the eastern part of the feature at metres 1 and 2. Besides the slag pieces, the feature yielded almost 300 pottery sherds, a ceramic spindle whorl and fragments of two nails. This significant concentration of slag pieces originated most probably in a blacksmith workshop operating here in the Early Middle Ages. The shape and form of the iron slag pieces (compare section 4.3) suggests that they might have been parts of a destroyed bloom.

The Sudetes do not abound in finds associated with the forging of iron blooms dated to the 9<sup>th</sup> and 10<sup>th</sup> centuries. The closest match to the Myślubórz feature are the 9<sup>th</sup> or 10<sup>th</sup> century remains of a hearth found at the Gilów hillfort (Jaworski and Pankiewicz 2008, 189-190). The Gilów hearth survived in a much better condition than the Myślubórz find. It was located in trench XV, within the so-called “main” hillfort. The device from Gilów consists of the remains of a burnt dome and a cake-shaped concentration of a few dozen iron lumps inside of the dome. The archaeologists interpreted it as a free-standing forging hearth, approximately 50 cm in diameter (Jaworski and Pankiewicz 2008, 189). Unlike the find from Myślubórz, which most probably operated within a house, the Gilów furnace was situated at least 10 metres away from the closest settlement structures. The object from Myślubórz is most probably a heavily damaged, originally cake-shaped structure, which is indicated by a significant concentration of large lumps of iron slag within just one square metre. The scattered charcoal pieces of oak, maple and fir (Sady 2019, 25-27) found in the feature’s fill with the slag lumps indicate how badly damaged the device was. The charcoal was sent to the Poznań Radiocarbon Laboratory for chronological verification (Fig. 11).

Evidence of iron processing in the Sudetes is scarce. Besides the device from Gilów, only slag and iron blooms found in Grodziszczce, Świdnica district, indicate the presence of local workshops within the hillforts. A large number of them occurred in a dwelling house



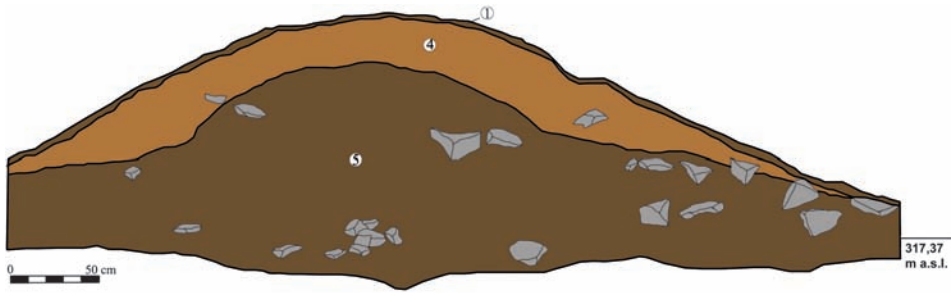


Fig. 13. Myślíbórz, Jawor district, site no. 2. Cross-section of the rampart in trench no. III/2018 (produced by E. Lisowska, S. Rodak)

(feature 5), and isolated specimens in the three additional features (Pankiewicz 2005, 57-58). They made neither a compact structure, as in Gilów, nor a concentration matching the Myślíbórz find. According to the author (Pankiewicz 2005, 58), the presence of slag lumps in a dwelling house might be associated with the final stage of iron processing, that is, the forging of the final products. None of the discussed sites yielded finds of smithing tools.

Blacksmith workshops more often occurred in the archaeological record in the lower parts of the western Sudetes – the Lusatian Highlands (Jaworski 2005, 258) – and at the sites located within the Sudeten foreland, which, geographically, does not belong to this region: *e.g.*, in Żarek (Piwko 1984), Źeleznice (Kozák 1969; Šalda 1969, 33, 104), Wysocko (Lodowski 1976; 1980) and Chotěbuz-Podobora (Kouřil 1994, 97-98).

Another feature from trench I/2018 contained only pottery sherds. Since only a small portion of it was excavated, its function cannot yet be determined. Trench II/2018 produced the last of the features: a relatively deep, irregular niche. Its upper parts yielded two early medieval pottery sherds. The fill consisted of loose soil mixed with small, sharp-edged stones. Most probably, the feature was initially a source of rock material used for the rampart. After the construction of the rampart construction was completed, the feature was filled with the remaining material to level the courtyard area. The presence of a pottery sherd in the top part of the feature might indicate that the levelling occurred before the hillfort was settled. Similar pits for extracting rock material were observed inside of the Gilów hillfort (Jaworski and Pankiewicz 2008, 184-188). In Gilów, only some of the pits were filled up and levelled. The remaining ones are still visible as depressions in the terrain.

The fortifications on Golica hill consisted of a rampart closing access to the rocky promontory with a moat on its outer side. The highest elevation difference between the remains of the rampart and the moat was 4 m. The trench was situated in the central part of the rampart. Inside of it, the investigators found a shaft core filled with very compact soil, mixed with small stones and a few specimens exceeding 20 cm (Fig. 13). This layer was covered with a slightly lighter and less compact layer with stones. No wooden con-

structions survived. Based on the fill, the embankment matches type II (WIIA), according to Jacek Poleski, in which the main element was the earthen rampart (Poleski 2004, 124). Wooden elements, which have not preserved, might also have been utilised (Poleski 2004, 124-125).

## 4. SMALL FINDS

### 4.1. Pottery

The archaeological investigations of the two hillforts in Myślubórz produced 320 early medieval pottery sherds. Most of them were found at site no. 2 on the top of Golica, in trench I/2018, located at the hillfort's courtyard close to the rampart. The remaining sherds come from the nearby trench II/2018 and the Kobylica hillfort.

Most of the vessels from Myślubórz were made of clay tempered with grains of sand and crushed stone, predominantly in the range of approximately 1-1.5 mm (temper classified as medium-grained – 37%) and about 0.5 mm (fine-grained temper – 16%). The fine-grained temper is often hard to identify macroscopically on the surface of the sherds, but is relatively well-visible on the fracture surfaces. In 20% of the sherds, both fine and medium-sized grains occurred. This type of temper was classified as fine- and medium-grained. In the bodies of the vessels, large grains of crushed stone measuring about 1.5-2 mm occurred (temper classified as medium- and large-grained – 6%). Additionally, in some of the specimens in the analysed sherd assemblage, mica temper of various fractions was identified (in total 21%; Pankiewicz 2012, 35-37).

The vessels from Myślubórz featured a slightly coarse outer surface with palpable grains (67%) or a smooth surface (33%). The deposition conditions seem to have strongly affected the surfaces of the vessels. A significant portion of the sherds are weathered, and the surface seems coarse due to the macroscopically visible grains of temper. Additionally, some of the sherds have a dusty-clayish coating of soil, which makes their colour light brownish. Presumably, most of the vessels featured initially a smooth, dark grey outer surface.

Out of the 320 pottery sherds, we selected 138 for a more thorough typological and stylistic analysis. We managed to reconstruct significant parts of 54 vessels. The vessels were hand-built with the use of the coiling technique and later turned on a potter's wheel. Turning affected mostly their rims, necks and shoulders (29 vessels). In some of the vessels, traces of rotation were only visible on the rims (2 specimens) or extended to the upper parts of the bodies (2 specimens). In all of the specimens, the inner side displays traces of smoothing with wet cloth. No fully-turned vessels were identified. On a few flat bottoms, prints of the wheel's axis occurred (Fig. 15: b, c, g, h; 16: d). Walls with a mean thickness ranging between 0.7 cm and 0.9 cm prevail (38 specimens). Besides them, thick-walled (over 1 cm – 5 specimens) and thin-walled (0.5-0.6 cm – 7 specimens) vessels occurred. The Myślubórz vessels were fired light brown or brown (37 specimens), brick-red (10 specimens)

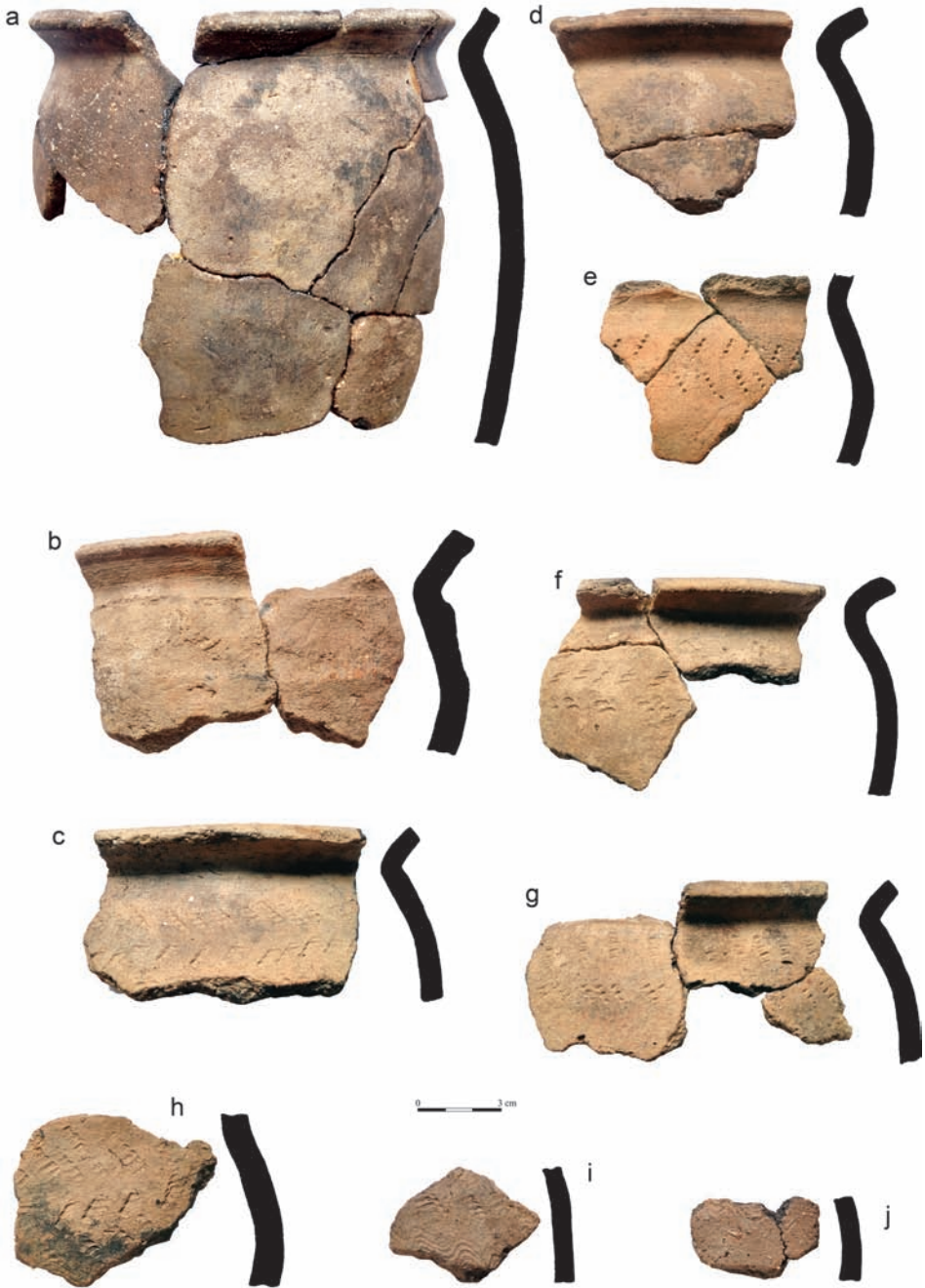


Fig. 14. Myślubórz, Jawor district. Selected pottery finds from site no. 4 (produced by E. Lisowska)



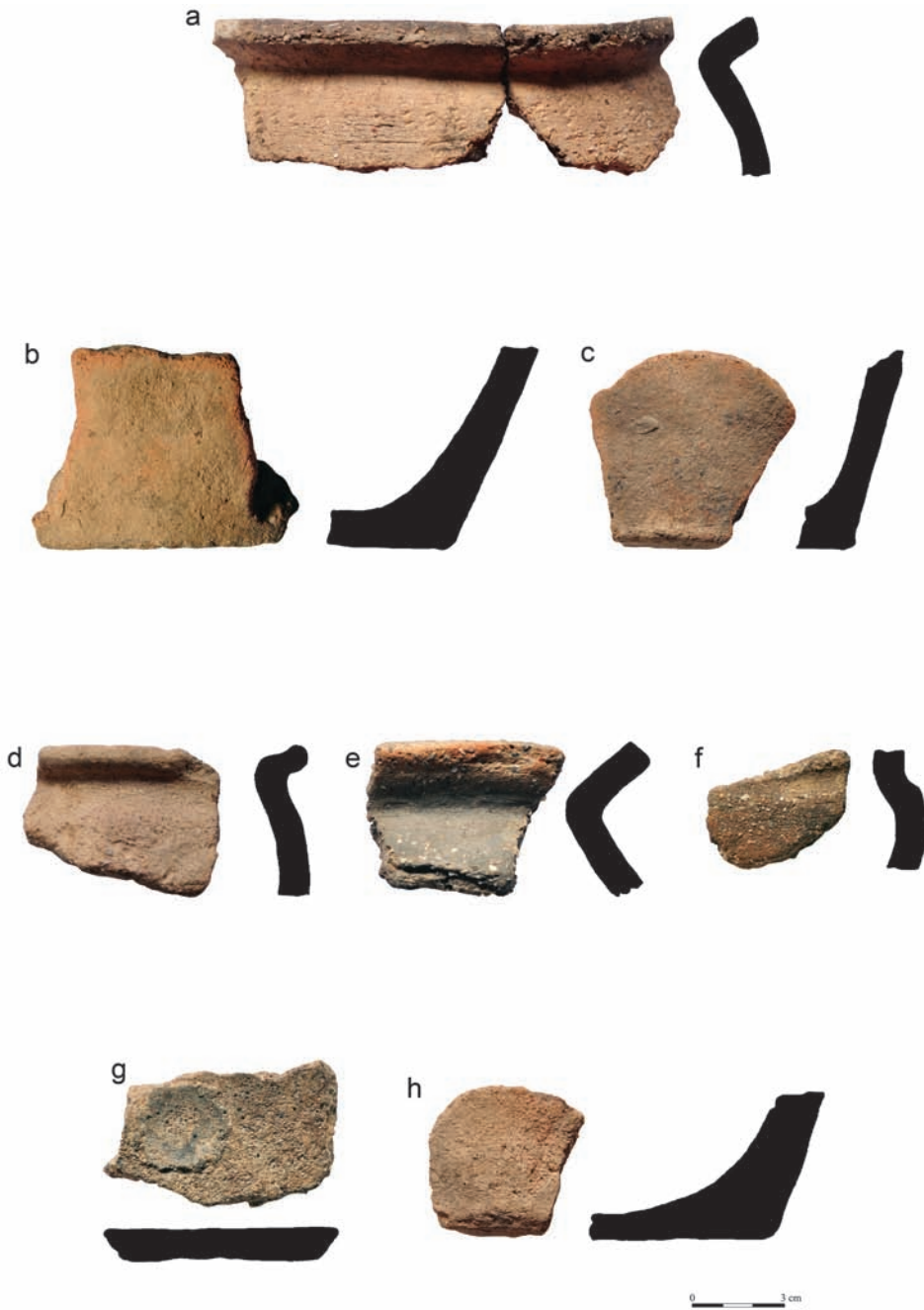


Fig. 15. Myślíbórz, Jawor district. Selected pottery finds from site no. 2 (produced by E. Lisowska)

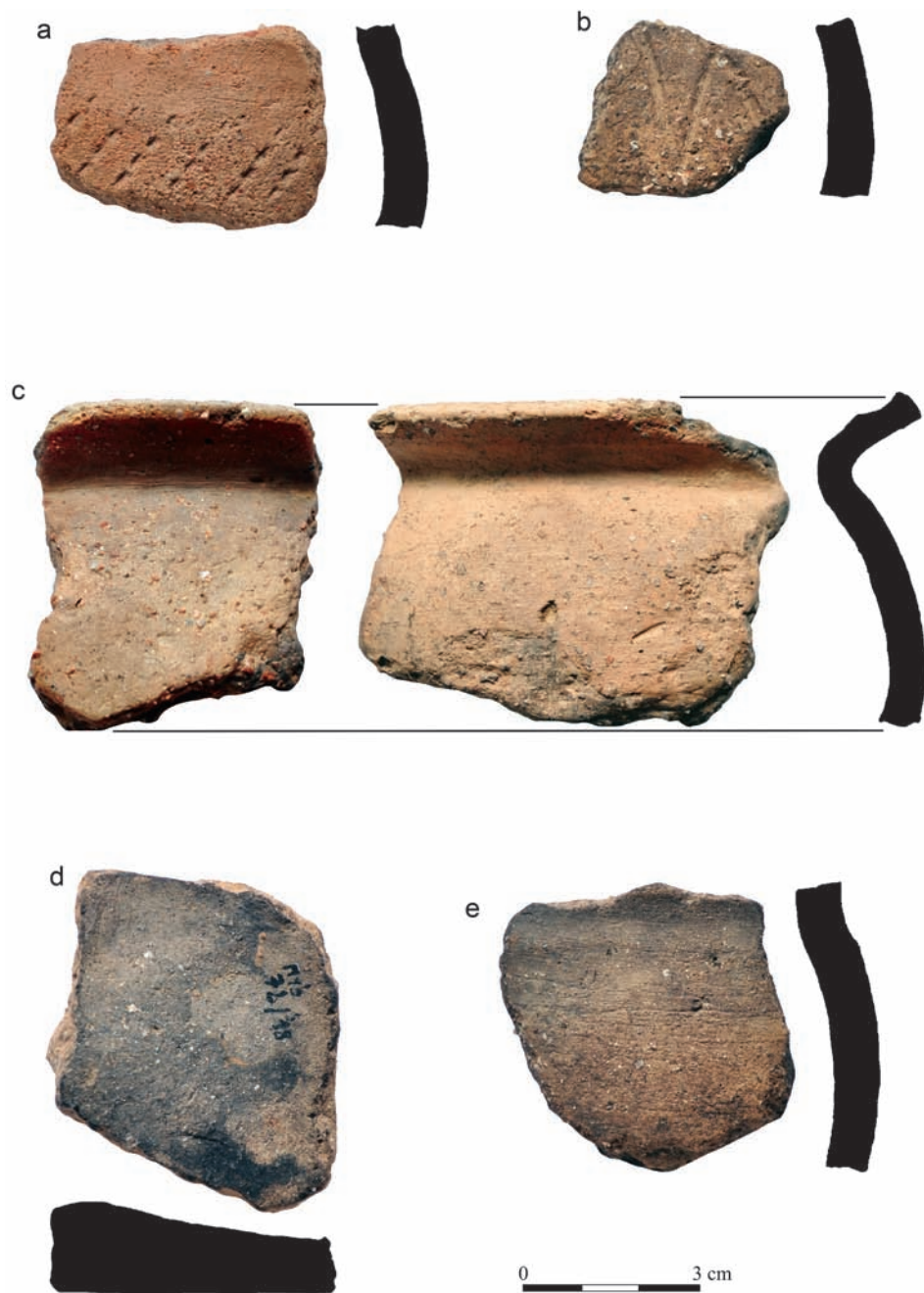


Fig. 16. Myślibórz, Jawor district. Selected pottery finds from site no. 2 (produced by E. Lisowska)

and cream-coloured (1 specimen). A few of the vessels were fired in reductive conditions, which made them grey or dark grey (6 examples).

The forms reconstructed from the Myślubórz pottery assemblage represent several typological groups. One such group includes vessels with S-shaped profiles and flat bottoms (group A, according to Aleksandra Pankiewicz; 2012, 40-47). Among them, specimens with short, arched necks and slightly profiled shoulders and bodies prevail. Their rims are most often straight, rounded, diagonally trimmed or with an additional groove around the outer edge; alternatively, they are gently marked on the upper edge, with a horizontally trimmed inner edge (7 specimens; Fig. 14: d, f; 15: a, d; 16: c). Vessels with barely marked shoulders and bodies (4 specimens) also have rims with a horizontally trimmed edge, sometimes with a groove around the rim or a small projection on its bottom surface (Fig. 14: a, e). Such vessels were popular in the Early Middle Ages and recorded in several south Silesian hillforts, *e.g.*, in Dobromierz, Gilów, Niemcza and Będkowiec (Pankiewicz 2012, 78-79). Similar S-shaped pots with a short, arched neck also occurred within the hillfort marked as site no. 3 in the Myślubórz Gorge (Jarysz and Limisiewicz 1998, Fig. 11). Isolated specimens of weakly shouldered vessels (1 vessel – Fig. 14: c) with a short neck, separated from the shoulder with a small offset, and with various outer edges were identified (2 specimens – Fig. 14: b, 15: f). The latter have their matches at the Gilów (Pankiewicz 2012, Fig. 16: e, 17: c, 22: d, 30: h), Graniczna (Pankiewicz 2012, Fig. 35: b), Grodziszczce (Pankiewicz 2012, Fig. 42: f) and Mierczyce (Pankiewicz 2012, Fig. 83: d) hillforts, as well as at the settlement site in Kamieniec Ząbkowicki (Pankiewicz 2012, Fig. 67: a, b). It is worth mentioning that most of them have a comb decoration. Undecorated specimens occurred only in Mierczyce and Kamieniec Ząbkowicki. Such a vessel was also identified during the last excavation season in Myślubórz and classified as smooth pottery – despite the severely damaged outer surface (Fig. 14: b). The rims preserved in the Myślubórz pottery assemblage suggest that the vessels were large (rim diameter between 16 and 24 cm – in 6 vessels), and medium-sized (rim diameter up to 15 cm – in the further 6 vessels).

Decorated vessels constitute a small percentage of the assemblage. They were most often ornamented with a row of single, double or even triple diagonal comb prints, arranged in a herringbone pattern (6 vessels – Fig. 14: e, f, g; 15: a; 16: a). In isolated specimens, the double comb-print rows arranged in the herringbone pattern had an additional wavy line (Fig. 14: c). The ornamentation covered only the upper parts of the bodies down to the curve. In the analysed assemblage, undecorated vessels – the so-called smooth pottery – dominated (13 vessels – Fig. 14: a, b, d; 15: d, e, f; 16: c, e).

The ceramic material used for the production of the smooth pottery was carefully prepared and based on well-selected, small- and medium-grained temper. The slightly dried vessels were polished, which made their texture smooth and the grains of temper only visible on the fracture surfaces (Pankiewicz 2012, 91-92). The smooth pottery from Myślubórz includes specimens with only a slight curvature, a short, arched neck and, most often, a rounded rim with the outer edge trimmed on the outer side. We assume that most



Fig. 17. Myślubórz, Jawor district, site no. 2. Spindle whorl found in trench I/2018 (photo by E. Lisowska)

of the sherds not used for the formal reconstruction belonged to this category. It is noteworthy that many of the pottery pieces included medium-grained temper and, at the same time, were of smooth texture and light brown colour. Some of the vessels made of clay with small-grained temper and decorated with comb ornaments might have possibly also belonged to this group in technological terms. Most of the reconstructed pottery forms come from the two excavated features in trench I/2018 at site no. 2 on Golica hill (features 1 and 2). Thus, the assemblage can be treated as consistent. Pottery assemblages from both of the hillforts were homogeneous, which confirms that the sites functioned simultaneously.

Smooth pottery was found at several archaeological sites in the southern part of Silesia and the Sudety mountains (Pankiewicz 2003, 145-148; 2005, 25-26, 70; 2012, 91-97; Jaworski and Pankiewicz 2007, 89-90; Stoksik and Paternoga 2009, 34-35). It constituted a large percentage of the ceramic material from the hillforts of Będ-kowice in the Ślęza Massif (Pankiewicz 2012, 93, Plate 1: a, c, e; 2: a-c, e, f) and Grodziszczce in the Sudety Foothills (group I – Pankiewicz 2005, 24-25; Plate 17: c, n; 18: i; 19: b, c; 21: a, c, h; 22: f, g; 25: g; 26: g, j, l, m; 27: a, g; 28: g, i; 31: c-f; 32: a, e, f), as well as from the settlement site in Stary Zamek (Pankiewicz 2012, 93, Plate 125: a, b; 126: a; 127: b, i). The vessels were also abundant at many other sites located between the Bóbr River basin in the west (*e.g.* in Wleń castle and Jelenia Góra-Grabary; Niegoda and Piekalski 1996, Fig. 1; Wrocławski 2001) and the Eastern Neisse in the east (*e.g.* the hillfort in Witostowice; Moździoch 1984, Fig. 28: e; Pankiewicz 2012, 93). According to the present state of research, smooth pottery is characteristic of Silesia and might be dated to the second half of the 9<sup>th</sup> and first half of the 10<sup>th</sup> century (Pankiewicz 2012, 94-97, 205).

#### 4.2. Spindle whorl

A ceramic spindle whorl was found in feature no. 2 in trench I/2018, made at the Golica hillfort (Fig. 17), 30 cm below the ground level. It was manufactured of untempered clay with a natural, 2-3% content of a small-grained temper. The completely preserved, barrel-shaped spindle whorl is cream-coloured and lacks ornamentation. Its diameter is 28 mm, and its height is 15 mm. The opening is slightly hourglass-shaped, with a diameter of 8 mm at its narrowest point.



### 4.3. Lumps of iron

Trench I/2018 in the Golica hillfort yielded over 200 lumps of slag, mostly in feature no. 2, in an area damaged by a tree root (Fig. 18). The lumps occurred mostly 7-20 cm below the ground level. Their highest density was observed between 10-15 cm below the ground within metres 1 and 14. The size of the lumps usually did not exceed 1 cm; only 11 fragments were between 1-7 cm. In total, 197 small lumps and 11 specimens over 1 cm were found. Judging from their shape, they were forging slag (Bartuška and Pleiner 1968): bowl-shaped and amorphous, with randomly solidified surfaces (Crew 1996; McDonnell 1991; Bachmann 1982; Suliga *et al.* 2002, Orzechowski and Wrona 2015). They are most probably parts of a destroyed forging bloom. Because of its location inside of a house, it might have been part of a hearth used for heating and cooking (Jasiewicz and Pelczyk 2002, 271).

### 4.4. Remaining metal items

Each of the hillforts yielded a single metal item. Feature no. 2 in trench I/2018 on Golica hill produced a rectangular-sectioned shaft of a forged nail (lacking the head). In trench III/2018 on Kobylica hill, an oblong eleven-centimetre-long, significantly corroded and barely identifiable item was found.

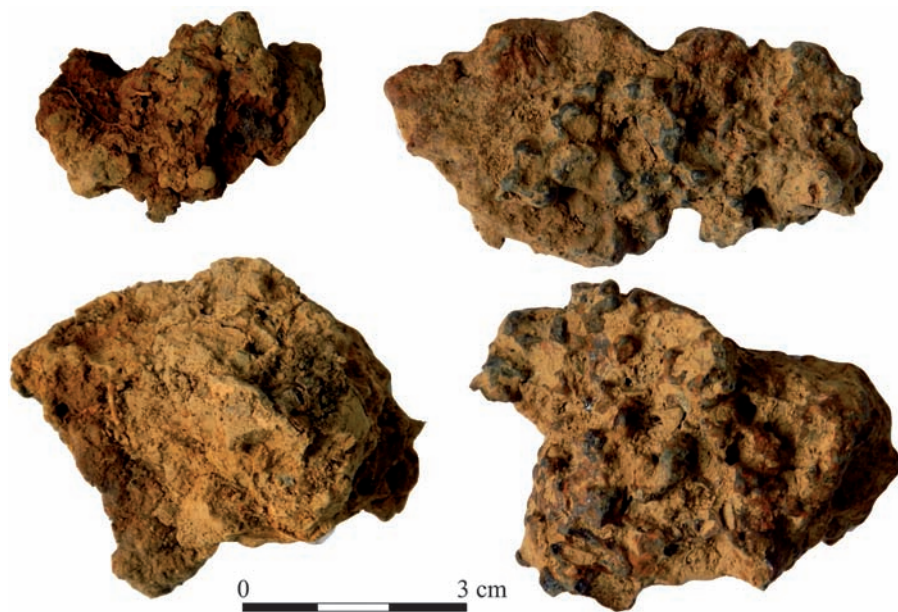


Fig. 18. Myślubórz, Jawor district, site no. 2. Bowl-shaped slag pieces found in trench I/2018 (photo by E. Lisowska)

#### 4.5. Flint flake

An isolated flake from erratic flint was found in trench I/2018 on Kobylica hill, in a layer between the weathered rock and the forest humus.

### 5. EARLY MEDIEVAL FORTIFICATION SYSTEM IN MYŚLIBÓRZ GORGE

Myślubórz Gorge is one of the narrowest passages through the Kaczawy Foothills towards the south-west. Entering the deeper parts of the mountains through this gorge required passing the hillfort on the southern side (site no. 10), followed by two hillforts at the mouth of the Kobylica stream valley (sites no. 2 and no. 4), and finally approaching the Lusatian culture hillfort adapted by the early medieval communities (site no. 3). The pathway through Myślubórz Gorge runs on the flat bottom of the gorge, featuring with a few narrow passes between the rocks. Walking from the mouth of the gorge in the north-east, the first and narrowest of these passes is located behind site no. 3.

We used two types of software to conduct a visibility analysis for the five defensive structures in the area. The assumption which allows for such an analysis is that the area surrounding the sites lacked trees, which were cut to raise the ramparts and houses, as

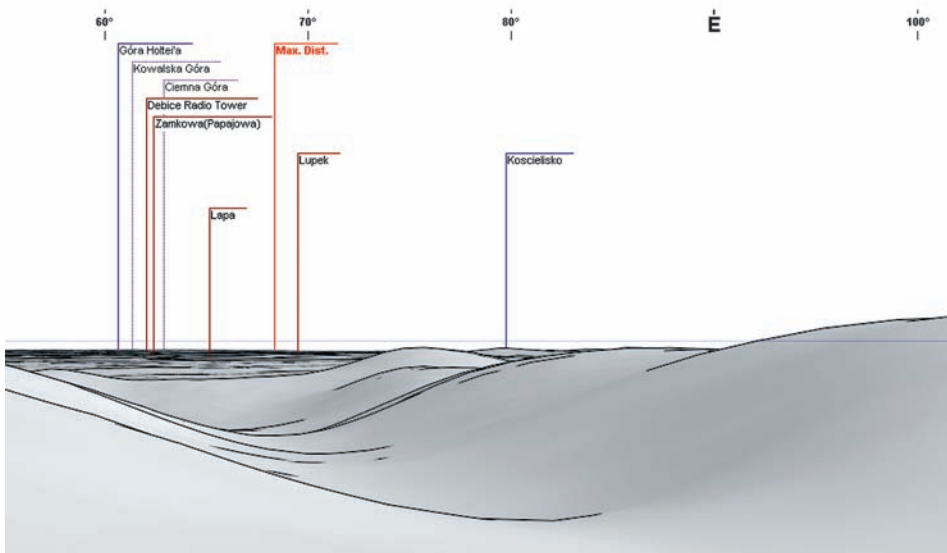


Fig. 19. View from site no. 3 towards the north-east, generated with the Zugspitze software (with permission by Ulrich Deuschle, [https://www.udeuschle.de/panoramas/makepanoramas\\_en.htm](https://www.udeuschle.de/panoramas/makepanoramas_en.htm))

well as to repair and heat them in the autumn and winter seasons (Williams 2000; Kaplan *et al.* 2009; Szabo *et al.* 2015). A microscale analysis was conducted in ArcGIS based on the digital terrain model made with the GRID network geometry (Kampczyk *et al.* 2016). We assumed the average height of the observer to be 1.60 m (compare – data on the height of early medieval populations: Piontek 2014, 83). Visibility was determined with the “*viewshed analysis*” function (Wheathley and Gillings 2000; 2002, 202-206). Another analysis determining the range of visibility from the selected points was a simulation conducted with the *Zugspitze* software ([www.udeutschle.de](http://www.udeutschle.de)). It generated the farthest possible observable points and compared the landscape elements visible from each of these points (Fig. 19, Table 2). Besides the four sites with 9<sup>th</sup> and 10<sup>th</sup> century materials, the analysis included a point located on Rataj hill, where a castle had functioned in the (12<sup>th</sup>?) 13<sup>th</sup>-14<sup>th</sup> century (Boguszewicz 1996; 2010, 237-239; Chorowska *et al.* 2009, 173-175). Although no finds from the 9<sup>th</sup> or 10<sup>th</sup> centuries were recorded there, it is the highest summit in the area with the widest visibility range. According to Krzysztof Jaworski (2019), such places – even if not permanently settled – were most probably used as observation points. From these points, potential threats could be communicated quickly and effectively, as they were located close to permanently inhabited sites (a 10-20-minute walk away). Evidence of such observation points might be found about a dozen kilometres east of Myślubórz Gorge, at an early medieval hillfort located on Basalt Mountain in Strzegom and on the nearby Krzyżowa Mountain. The hillfort was destroyed by a stone (mostly basalt) quarry. It was mostly the German scholars who established and published its chronology (Bersu 1930; Jaworski 2005, 68-70). On the top of Krzyżowa Mountain K. Jaworski discovered lines incised in the stone which represent three engravings of Nine Men’s Morris board game, also known as The Mill Game, or Merels (Jaworski 2019). Krzysztof Jaworski cautiously links them to the 11<sup>th</sup>-12<sup>th</sup> century hillfort on the neighbouring Basalt Mountain.

Because of the size of the examined structures in the micro-area of Myślubórz Gorge (Fig. 20, 21, 22), some of the points within them allowed observers to see one another, and some did not (Table 1). This is especially true of site no. 3, which offered a view of each of the other sites (1, 2, 4 and 10) – if the observer was in the right position. Different places within site no. 3 allowed for viewing different neighbouring sites. For instance, an observer standing on the top of the outer rampart of site no. 3 could only see site no. 1, and not structures on sites 2, 4 and 10. Moving down towards the inner rampart, they would walk out of the blind spot and all at once notice the potential observers at sites 2 and 4. Walking further down behind the line of the inner rampart they could notice observers standing within site no. 10.

The fortification system in Myślubórz Gorge allows for viewing almost 90% of the study area – depending on the position of the observer. Considering the limitations of human vision, the distances between the places most remote from each other (*e.g.*, site nos. 3 and 10; 1 and 3) were such that a person at one site probably could not see a single person at another site. However, observing more distinctive and sizeable objects, such as smoke or

**Table 1.** Mutual visibility range from the Mysłibórz hillforts with the record sheet of distance between them in a straight line and relative heights (up and down)

Site number, local name, altitude in m a.s.l.	Distance in metres – in a straight line	Viewed site	Altitude difference down	Altitude difference up
Site no. 1 – Rataj, 350 m a.s.l.	850 m	Site no. 2 (small part of the site visible)	60 m	50 m
Site no. 1 – Rataj, 350 m a.s.l.	2000 m	Site no. 3 (half of the site area visible)	80 m	80 m
Site no. 1 – Rataj, 350 m a.s.l.	600 m	Site no. 4 (whole site visible)	45 m	25 m
Site no. 1 – Rataj, 350 m a.s.l.	580 m	Site no. 10 (whole site visible)	45 m	10 m
Site no. 2 – Golica, 342 m a.s.l.	850 m	Site no. 1 (only northern part visible)	60 m	50 m
Site no. 2 – Golica, 342 m a.s.l.	1150 m	Site no. 3 (only central part between the ramparts visible)	70 m	80 m
Site no. 2 – Golica, 342 m a.s.l.	180 m	Site no. 4 (whole site visible)	40 m	30 m
Site no. 2 – Golica, 342 m a.s.l.	870 m	Site no. 10 (whole site visible)	80 m	55 m
Site no. 3 – Schanzenberg, 350 m a.s.l. in the highest point	2000 m	Site no. 1, (only small part visible if viewed from the area between the outer and inner rampart)	80 m	80 m
Site no. 3 – Schanzenberg, 350 m a.s.l. in the highest point	1150 m	Site no. 2, (only small part visible if viewed from the area between the outer and inner rampart)	80 m	70 m
Site no. 3 – Schanzenberg, 350 m a.s.l. in the highest point	1370 m	Site no. 4, (only small part visible if viewed from the area between the outer and inner rampart)	90 m	70 m
Site no. 3 – Schanzenberg, 350 m a.s.l. in the highest point	1900 m	Site no. 10 (only small part visible if viewed from the lowest, southern part of the promontory)	90 m	55 m
Site no. 4 – Kobylica, 330 m a.s.l.	600 m	Site no. 1 whole site visible	25 m	45 m
Site no. 4 – Kobylica, 330 m a.s.l.	180 m	Site no. 2 whole site visible	30 m	40 m



Table 1.

Site number, local name, altitude in m a.s.l.	Distance in metres – in a straight line	Viewed site	Altitude difference down	Altitude difference up
Site no. 4 – Kobylica, 330 m a.s.l.	1370	Site no. 3 only central part between the ramparts visible	70 m	90 m
Site no. 4 – Kobylica, 330 m a.s.l.	760 m	Site no. 10 whole site visible	30 m	15 m
Site no. 10 – Skalki, 315 m a.s.l.	580 m	Site no. 1 whole site visible	10 m	45 m
Site no. 10 – Skalki, 315 m a.s.l.	870 m	Site no. 2 whole site visible	55 m	80 m
Site no. 10 – Skalki, 315 m a.s.l.	1900 m	Site no. 3 (only the lowest part below the inner rampart visible)	55 m	90 m
Site no. 10 – Skalki, 315 m a.s.l.	760 m	Site no. 4 whole site visible	15 m	30 m

Table 2. Visibility range of the farthest point from the examined sites based on the simulation made with the Zugspitze software (stars marks distances beyond the visibility range of human sight)

Site	Viewing direction (field of vision 120°)	Potentially farthest visible point	Visible strategic points
No. 1 – Rataj	NE	80 km*	Strzegom Hills, Ślęza Massif, Chełmiec (Waldenburg Mountains), Giant Mountains
	NW	75 km*	
	SE	62 km*	
	SW	54 km	
No. 2 – Golica	NE	81 km*	Basalt Mountain, Ślęza Massif, Śnieżka and Czarna Kopa (Giant Mountains), Baraniec (Katzbach Mountains)
	NW	75 km*	
	SE	63 km	
	SW	53 km	
No. 3 – <i>Schanzberg/Schweden Schanzen</i>	NE	80 km*	Jagodzina (Strzegom Hills), Basalt Mountain, Wielka Sowa, Giant Mountains
	NW	4 km	
	SE	18 km	
	SW	53 km	
No. 4 – Kobylica	NE	65 km*	Krzyżowa Mountain and Basalt Mountain (Strzegom Hills), Wielka Sowa and Owl Mountains, Chełmiec (Waldenburg Mountains),
	NW	75 km*	
	SE	52 km	
	SW	28 km	
No. 10 – Skalki	NE	80 km*	Strzegom Hills, Ślęza Massif, Chełmiec (Waldenburg Mountains), Łabski Szczyt (Giant Mountains)
	NW	75 km*	
	SE	62 km*	
	SW	48 km	

a large bonfire, would be possible. The location of site nos. 2 and 4, situated only 180 m from each other, as the crow flies, would make it possible not only to see a human figure but also to identify their movement. In this way, the hillfort complex in Myślubórz Gorge, with a possible observation point or a small watch post on Rataj hill, constituted a unique and consistent defensive system.

As far as the areas outside of Myślubórz Gorge are concerned, each of the hillforts offers a different panoramic view. Thus, the complex makes it possible to see various strategic points. In theory, the farthest visible point from sites 1, 2, 3 and 10 is the area of the Oborniki Hills. A simulation made with the *Zugspitze* software estimates this distance to be 80 km. Noticing anything in the Silesian Lowland from such a distance is not possible considering the limits of human vision – even in favourable weather conditions (Bohren and Frazer 1986). The human sight range reaches up to  $3.56\sqrt{h}$  kilometres, where  $h$  is the sight height in metres above sea level (Weintrit 2013, 168). Assuming that the eyes of an observer looking towards the area of the Silesian Lowland (varying within the sight range between 100 and 120 m a.s.l.) are 1.6 m above the ground, and they stand on a hill that is 350 m high, the  $h$  height required to see an object 80 km away ranges between 231.6 and 251.6 m. In such a situation, the maximum range of visibility to the north varies between 54.1 km in the north-east and 56.4 in the north-west, where the elevation difference between the lowland area and the highest analysed point is 20 metres. The range of visibility is much more extensive towards the south and south-west due to the altitudes of the higher Sudety ranges (we used the same formula here but the sight direction is from the highest to the lowest point). For instance, Śnieżka (1602 m a.s.l.) – the highest summit in the Sudetes – might be observed from a distance of about 140 km if the weather conditions are favourable. Such calculations are not utilised by the GIS software, which uses the relation between the height of the observation point, the distance and the visibility angle of the Earth's surface (Wheatley and Gillings 2000; Smith and Cochrane 2011; Wheatley 1995)

The simulations discussed above allowed for a comparison of the possibilities of visibility analysis using two independent procedures. The ArcGIS software, which includes the height of the observer, the angle, and the maximum sight range, determines the maximum range of visibility without including the additional visibility index of  $3.56\sqrt{h}$  kilometres. The *Zugspitze* programme – used mostly by tourists – makes it possible to quickly generate panoramic views. It utilises a simple sketch background and GoogleMaps data. The users obtain information on the names of the summits, their altitudes and the distance between them, as the crow flies.

The particular hillforts (see Table 2) offer views of the most important strategic points in this part of Silesia: the Ślęza Massif, the Strzegom area with Krzyżowa Mountain, the Owl Mountains, and other places. Depending on the observation point, the views change slightly – mostly because some parts become obscured by the closest hills in the Kaczawy Foothills.

The visibility analysis indicates that at every stage of the passage through the gorge, a group of people travelling that way would be visible from at least one, and most often

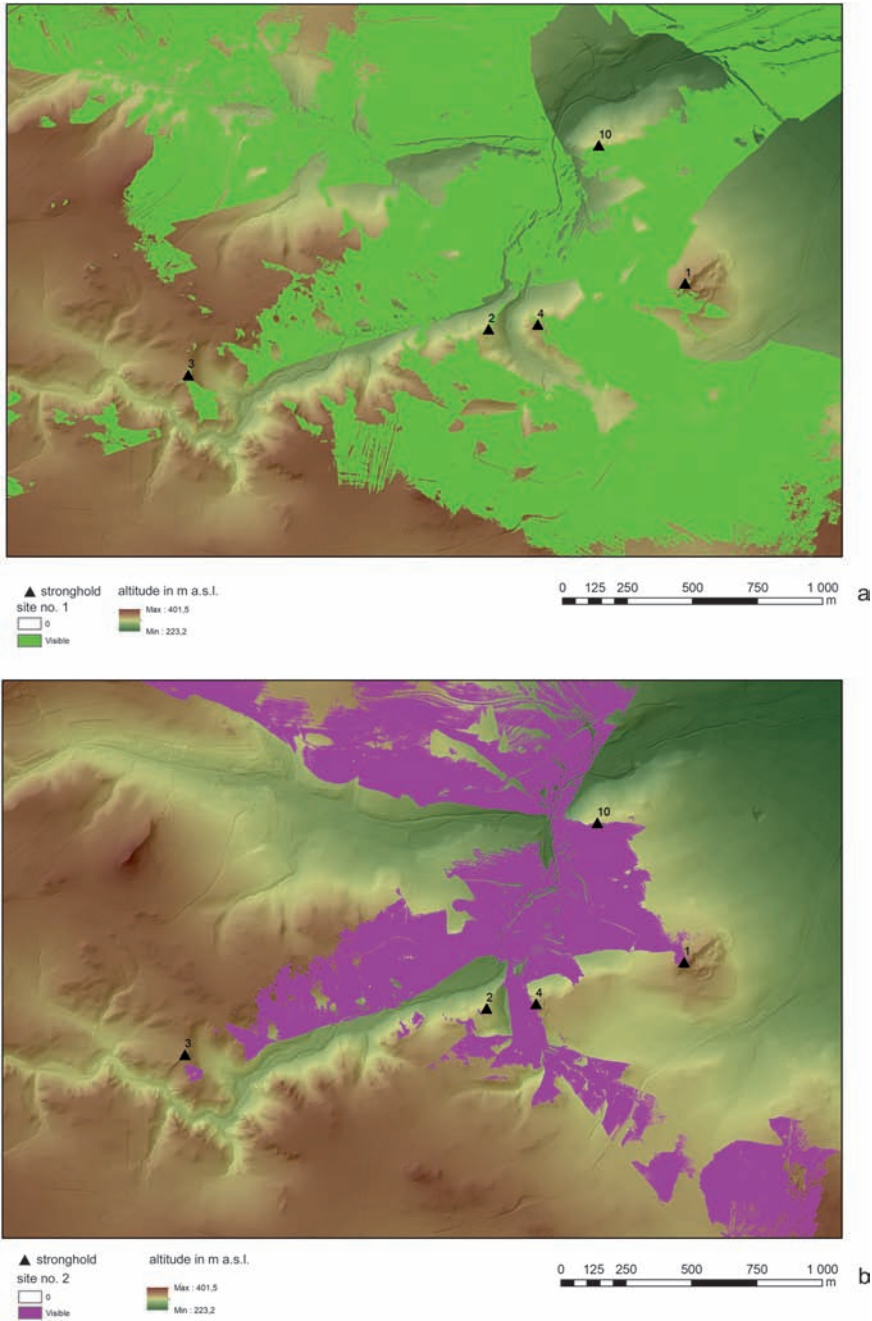


Fig. 20. Myślíbórz Gorge, visibility range from the sites. a – visibility range from site no. 1 (Rataj); b – visibility range from site no. 2 (Golica) (produced by A. Mikołajczyk)

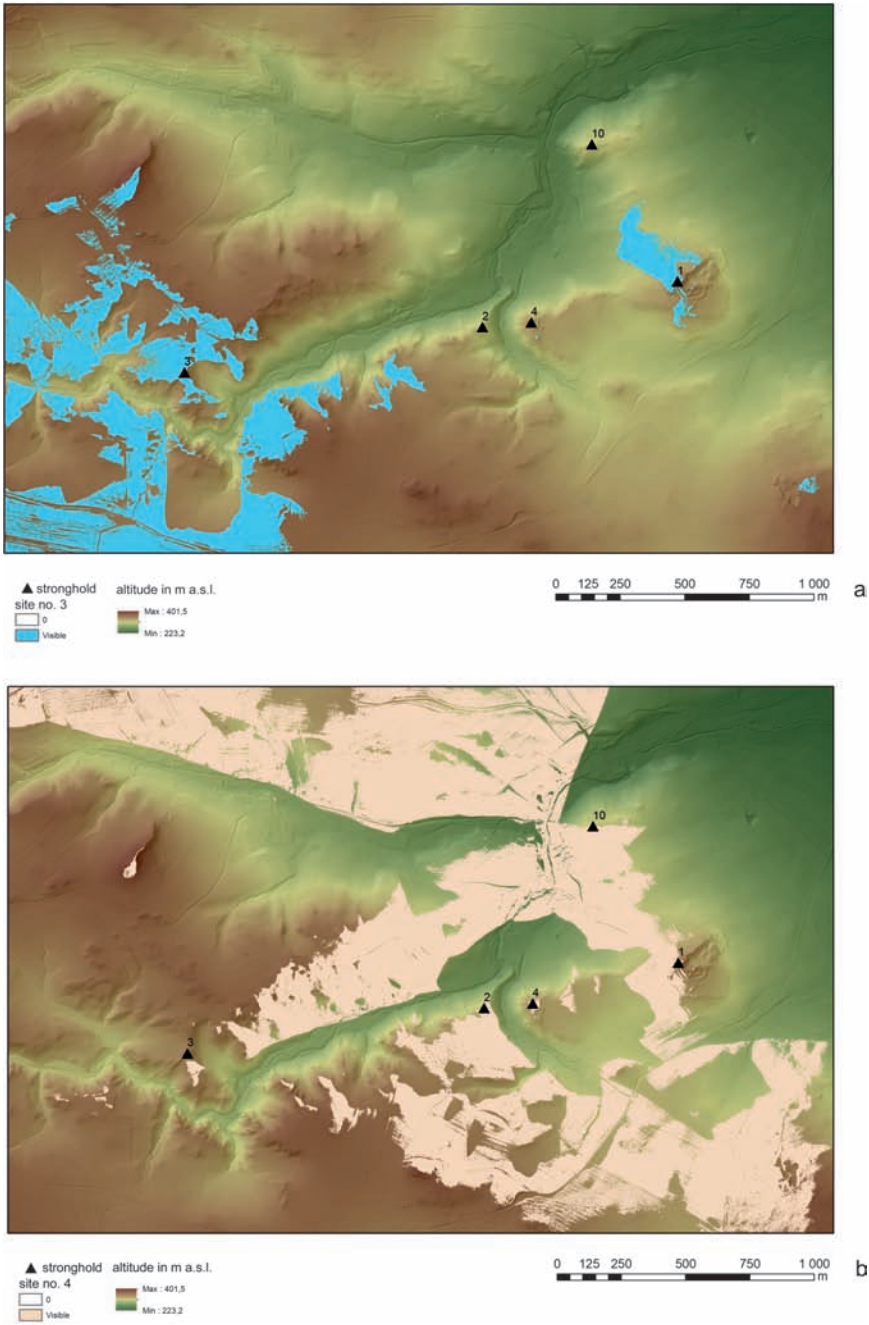
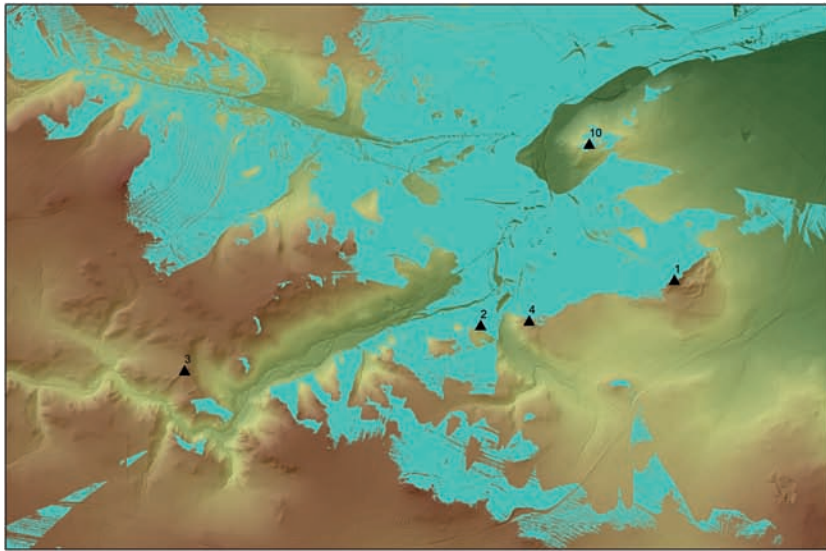


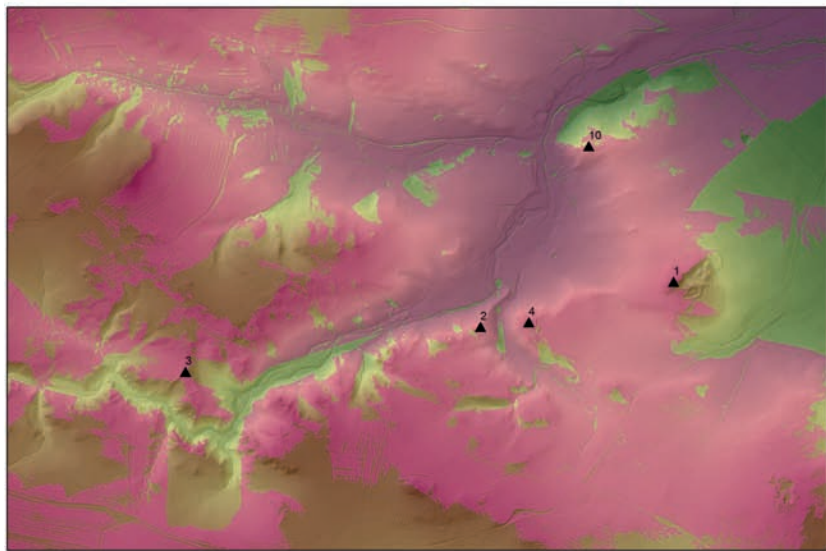
Fig. 21. Myślíbórz Gorge, visibility range from the sites. a – visibility range from site no. 3 (Schanzberg); b – visibility range from site no. 4 (Kobylica) (produced by A. Mikołajczyk)





▲ stronghold altitude in m a.s.l.  
 site no. 10  
 0 Not Visible  
 Visible  
 Max: 401.5  
 Min: 223.2  
 0 125 250 500 750 1 000 m

a



▲ stronghold altitude in m a.s.l. Observer 1.6 m above  
 0 Not Visible  
 Visible  
 Max: 401.5  
 Min: 223.2  
 0 125 250 500 750 1 000 m

b

Fig. 22. Myślíbórz Gorge, visibility range from the sites. a – visibility range from site no. 10 (Skałki); b – visibility range of the passage through Myślíbórz Gorge from all of the examined sites: 1, 2, 3, 4 and 10 (produced by A. Mikołajczyk)

from two or more hillforts. Why was such a great effort made to raise structures to protect the passage through this area? The system does not have any parallels in Central Europe, and seems to be a unique solution situated in a specific geomorphological environment.

## 6. DISCUSSION

The rampart arrangements in the Myślubórz Gorge hillforts represent a few types. Two of the hillforts, which have transverse ramparts separating the rocky promontory from the accessible slope, are especially noteworthy. The Czech literature classifies them as the *ostrožna*-type (Turek 1957). Władysław Kowalenko, the first Polish scholar mentioning such structures, refers to them as promontory hillforts with a transverse rampart (Kowalenko 1938, 66f.), while Andrzej Żaki cites them as hillforts with sectional (barrier) ramparts (Żaki 1974, 38). Jerzy Olczak and Kazimierz Siuchniński mention them as single-spaced hillforts with a transverse rampart embanking the promontory at its base (Olczak and Siuchniński 1976, 118). Similar terms appear in several other hillfort classifications (Jaworski 2005; Poleski 2004; 2013; Wojenka 2010). Such structures occur both on the northern and southern side of the Carpathians and Sudetes, mostly in lowland hillforts located on river promontories (Tomková 1999; Olczak and Siuchniński 1976; Sláma 1986). Hillforts with transverse ramparts located on mountain promontories are relatively rare in comparison to their lowland counterparts. The only other place in the Sudetes where such structures occurred was in Stary Książ (Jaworski 1994; Jaworski 2005, 113). Hillforts of slightly different shapes, determined by the local terrain, were recorded in the Carpathian and Upper Silesian zone, e.g., in Mymoń, Sanok district, Kamieniec, Tarnowskie Góry district (Poleski 2013, 60-62, 335-336) and Kostolec, okres Piešťany (Ruttikay 2006). In Bohemia, they were found in Dneboh, okres Mlada Boleslav; Čtyřkoly, okres Lštěni; Chloumek, okres Mlada Boleslav; Chum, okres Mlada Boleslav; and Děčín. They are named *ostrožne na vybehu nauvsí* – promontory hillforts with a transverse rampart (Slamá 1986, 65-67, 72; Tomková 1999, 248).

The *ostrožna*-type defensive structures with uni- or multivallate earthworks emerged for the first time in the Lusatian culture in the Hallstatt A2 period (Veličik 1983; Bartík 2015). Site no. 3 (*Schanzberg*) in Myślubórz, with structures interpreted as Lusatian culture houses, as well as 9<sup>th</sup>-10<sup>th</sup> century pottery sherds, is also a promontory enclosed with a double rampart. At the present stage of research, it is difficult to determine when the defensive features were raised, as it might have happened both at the turn of the Bronze and Iron Ages and in the Early Middle Ages. The artefacts and features discovered at the site (Jarysz 1997) suggest a prehistoric dating of the structures, which might have been potentially enhanced later, in the Early Middle Ages. For establishing a more certain chronology, new excavations with C14 sampling would be necessary.

Apart from the original form, the Myślubórz hillforts have a unique spatial relation to one another. So far, nothing indicates that any of them had been burnt, and a new,

neighbouring structure was built to replace the old one. According to Andrzej Źaki (1958) and Jacek Poleski (2004), this was the case in the three hillforts located within the Dunajec River basin. The hillfort in Naszacowice, used from the second half of the 8<sup>th</sup> to the mid-9<sup>th</sup> century, was the earliest. After a fire, a new hillfort was built nearby, in Podegrodzie, on “Zamczysko” mountain. It functioned in the second half of the 9<sup>th</sup> century (Poleski 2004, 320), but was also soon destroyed by a fire. The ramparts on the neighbouring summit in Podegrodzie, “Grobla”, were constructed at the time when the Zamczysko hillfort ceased to exist (Poleski 2004, 107).

A complex of neighbouring hillforts of similar chronology (8<sup>th</sup>-10<sup>th</sup> century) was also found in the Wisłoka River basin, in the Jasło-Krosno Basin. It consists of five hillforts: in Przeczyca, Trzcina, Wietrzno, Brzezówka and Brzezowa (Poleski 2006; Szmyd 2017). The distances between them were much greater than between the Myślubórz Gorge hillforts, but they also allowed for the observation of the river and watercourse valley passes.

In the vicinity of Sanok, in the San River valley, a group consisting of a few hillforts was identified: hillforts in Horodno and Horodyszczce – probably of 8<sup>th</sup>-10<sup>th</sup> century chronology – and hillforts in Sanok and Sanok-Biała (Parczewski 1984; 1988; Parczewski and Pohorska-Kleja 1995; Kotowicz 2005; 2006; Ginalski *et al.* 2013; Zielińska and Kotowicz 2016). They did not all function simultaneously. The beginnings of the earliest of them, situated in the Trepcza area, might be dated from the end of the 9<sup>th</sup> through the 10<sup>th</sup> century. The later objects in Sanok and on Zamczysko mountain in Sanok-Biała Góra were established in the 11<sup>th</sup> or 12<sup>th</sup> century. Maria Zielińska and Piotr Kotowicz argue that their purpose was to protect the south-western part of the Principality of Halych, and particularly the trade route running through the Carpathians and the San River valley from the Kingdom of Hungary to Ruthenia, as well as its settlement hinterland in the Sanok area (Zielińska and Kotowicz 2019, 578). The characteristic feature of this hillfort complex and the complex in the Myślubórz Gorge, as least as far as the 9<sup>th</sup> and 10<sup>th</sup> century structures are concerned, is the presence of a nearby burial mound cemetery.

A defensive system similar to the one from Myślubórz Gorge was identified in Halych, Ukraine (Tomenczuk 2017). The complex was developed in three stages – beginning from the 10<sup>th</sup> until the 13<sup>th</sup> century. Between the 11<sup>th</sup> and 13<sup>th</sup> centuries, it included a few hillforts (later castles), palace complexes and a cemetery. In Bohdan Tomenczuk’s opinion, its function was to guard the crossing, which was part of a few trans-European and local routes (Tomenczuk 2017, 521-522). The characteristic feature of the Myślubórz and Halych complexes is the presence of a transverse rampart at some of them. In both of the complexes, the distances between the particular hillforts were small and often did not exceed 1-1.5 km.

The Sudetes feature two further groups of clustered, similarly dated hillforts. The first of them was situated in the Strzegom area. It consists of five complexes: the hillfort on Graniczna mountain (from the second half of the 9<sup>th</sup> to the first half of the 10<sup>th</sup> century) and on Basalt Mountain in Strzegom (first phase: 9<sup>th</sup>-10<sup>th</sup> century), defensive structures in

Dobromierz, Pietrzyków (mid-10<sup>th</sup> century) and Gniewków (Bolkowice – the end of the 9<sup>th</sup> through the 10<sup>th</sup> century) (Jaworski 2005, 64-70; Pankiewicz 2012, 90-104; Rodak 2017, 225, 232-233). Although distances between these structures vary from 3 to 20 km, the local geomorphological conditions made them function as a system, allowing for constant observation of the route from Strzegom towards Bohemia. Another hillfort cluster is located within the Żytawa-Zgorzelec Depression. It includes hillforts of Jauernick, Landeskrone, Koźlice (10<sup>th</sup> century), and Tylice (10<sup>th</sup> century; Jaworski 2005, 46-54; Fokt 2013, 49-50, 52-54, 57-59). Complexes consisting of two similarly dated hillforts are much more common. According to Dominik Nowakowski (2017), as many as seven of them were identified in Poland.

In light of the presented discussion, the defensive system in Myślubórz Gorge is the most spatially and chronologically coherent fortification complex established in the 9<sup>th</sup> and 10<sup>th</sup> centuries in the Sudetes. Most scholars agree that in the pre-state period, the area was inhabited by the *Trebouane* tribe (Lodowski 1980, 125; Jaworski 2005, 304-305; Tyszkiewicz 2000; Moździoch 2017, 136). The first document to mention this tribe was the *Prague document*, describing the geographical borders of the Prague diocese in 973. Despite the academic criticism of the data included in the 1086 copy of the document commissioned by Emperor Henry IV for the Prague diocese (Matla-Kozłowska 2008), many scholars use the information it contains to determine the territories inhabited by some of the Silesian tribes in the mid-10<sup>th</sup> century. Besides the *Trebouane*, the document mentioned tribes such as the *Zlasane*, *Dedosize*, *Milceni*, *Chrouati* and *Poberane*. The research results might strengthen the hypothesis by Krzysztof Fokt that the *Trebouane*, not mentioned in the *Bavarian Geographer*, might have settled the discussed area after this document had been issued and before the period referred to in the *Prague document* (Fokt 2016, 196). The chronology of the fortifications – not earlier than the final part of the 9<sup>th</sup> century (not considering the Early Iron Age phases of sites 3 and 47) and not later than the 10<sup>th</sup> century – is in concert with this hypothesis. What is more, the artefacts found at those sites were culturally homogeneous, and the visual effect of the hillforts dominating the space at the mouth of the gorge (discussed in this paper) was well-calculated.

Hence, the main question is that of the purpose of this system. In light of the discussed evidence from other areas, the most straightforward and rational explanation would be its purely defensive function. The system of hillforts built or adapted at the end of the 9<sup>th</sup> century protected the passage through Myślubórz Gorge. Such warning and defensive elements occurred in the Sanok area, Jasło Basin, Dunajec River basin, Halych and the Sudetes. However, in all of these cases except for Halych, the distances between the objects were greater than in the Myślubórz area. In this respect, the discussed defensive system is unique. The hillforts might have additionally protected sacred places (burial mound cemetery, spring, rock formations). However, the latter is only a speculation, lacking any archaeological and historical evidence. The deposition of the seven iron bowls of the Silesian type in the central part of the gorge suggests that the structures were in use in times of



political unrest or wars. Possibly, the hillforts are silent witnesses of the “ephemeral tribes and the phoney war of giants” (Fokt 2016).

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