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MILITARY ACCESSORIES FROM BOLESŁAWIEC ON THE PROSNA[1]

Bolesławiec – small town situated on the border between the District of Wieluń, the District of Ostrzeszów and Opole Silesia, on the road leading from Poland to Wrocław in Silesia – was founded by Bolesław the Pious, Duke of Kalisz, in 1266 (Fig. 1). In 1335, in Vyšehrad in Hungary, an agreement was signed between John of Luxembourg, King of Bohemia, and Casimir the Great, King of Poland, where John of Luxembourg promised to knock down the castrum in Bolesławiec, which temporarily belonged to Bohemia. Moreover, Casimir the Great, who was taking the castle over, took on an obligation not to rebuild the castle, which would become an obstacle to easy travelling between Poland and Silesia[2]. We do not know what the future fate of John of Luxembourg's castrum was, because no traces of it were ever found. Casimir the Great, however, did not keep his promise and built a new castle in Bolesławiec immediately after the treaty, in the years 1336-1339. In addition, this was probably his first defensive undertaking.

The castle was erected in the Prosna River valley, on the remnants of the bank uplands. The layout of the structure followed the pattern of early medieval earth and timber strongholds – the brick wall on stone foundations consisted of 23 straight sections of different lengths, meeting at an obtuse angle and joined with specially-shaped bricks.

Fig. 1. Location of Bolesławiec on the map (Illustrated by E. Wtorkiewicz-Marosik).

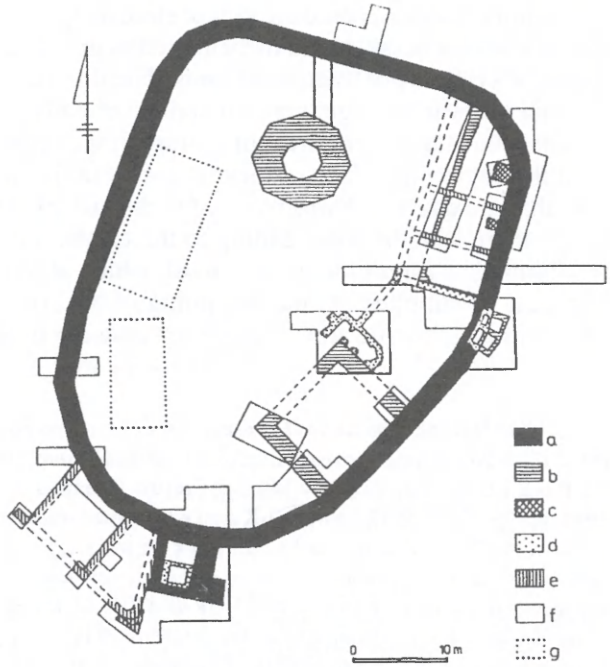

Fig. 2. Sketch of the castle after the archaeological works of 1972-1979 with the excavations and relics of brick architecture. a. walls dating back to c. 1335, b. walls dating from the years 1370-1390, c. walls of the 16th century, d. walls dating from the years 1580-1615, d. walls dating from the years 1615-1629, e. archaeological excavations, f. probable location of the timber buildings. (Illustrated by E. Wtorkiewicz-Marosik).

[1] I would like to thank my colleagues Marian Głosek and Witold Świętosławski for their help with the writing of this article.

[2] T. Poklewski-Koziełł, *Średniowieczne zamki między Prosną i Pilicą (Medieval Castles between the Prosna and the Pilica)*, Łódź 1992, pp. 16-19; by the same author, *Rubież Prosny i Baryczy 1333-1401. Fortyfikacje stale (The Border on the Prosna and the Barycz 1333-1401. The Permanent Fortifications)*, Łódź 1994, pp. 41-43.

The castle was equipped with a gatehouse. From the outside the walls were strengthened with sand. Inside the walls were wooden buildings, most probably the living quarters and the kitchen. The castle was the headquarters of the military crew whose task was to control an important ford across the Prosna[3] (Fig. 2, 3).

After Casimir the Great's death in 1370, his successor, Ludwig of Anjou, pledged Bolesławiec together with the District of Wieluń and the District of Ostrzeszów as security to Władysław, Duke of Opole. Thanks to him, the castle was added on. The outer walls and the rampart were made taller and an octagonal tower and two brick houses were erected in the courtyard. One of the buildings was reserved for official occasions and the other was residential in character. A latrine tower was built at the outer wall, where the wall and the dwelling house met[4].

Władysław Jagiełło came to the Polish throne in 1386. The Polish gentry were putting pressure on him to regain the pledged territories. In 1391 or 1393, a war broke out with the Duke of Opole and in 1393 Polish troops laid siege to the castle of Bolesławiec. A bombard was used to attack the castle with heavy gunfire. It seems that as a result of this bombardment the dwelling house, which might not have been completed yet, was destroyed. However, the castle itself was not taken. Bolesławiec passed into the King's hands only after the Duke of Opole's death, that is, in 1401[5].

Bolesławiec become the seat of starosta (governor) and its successive tenants belonged to the wealthy nobility. Some of them were lords. The first repairs after the war damage were carried out already by the first starostas in the fifteenth century. It was then, or at the beginning of the sixteenth century at the latest, that the courtyard was paved. On the hillock on which there was the road leading to the castle, a lower farm yard (przygródek) was built, which served as a base of supplies. At the beginning of the sixteenth century, rich tile stoves in the renaissance style patterned on the stove tiles from Wawel Royal Castle in Cracow were built in the castle houses. However, during the sixteenth century the condition of the castle was gradually deteriorating. The descriptions found in inspection records and inventories are evidence of the starostas' lack of concern with the castle. It was in the castle farm, which brought in profits, that all their money was invested. It seems, however, that the castle had not yet lost its military importance at that time as firearms and bolts for crossbows were still stored there[6].

It was only in the years 1615-1628 that Satrosta Casper Denhoff turned Bolesławiec Castle into a lordly manor house. The living quarters were enlarged, a castle kitchen was built outside the defensive wall, next to the gatehouse, and an Italian garden was created outside the wall, too. Finds from the archaeological strata dated at the time of Denhoff seems to support the assumption that the castle did become the home of a rich court. There were found numerous remnants of luxury pottery, glass and other objects. Even the animal bones found at the castle rubbish dump are evidence that the court would only eat better pieces of meat. At the dump there were also oyster shells. However, as a result of Denhoff's modernization, and especially because of the passages made to the kitchen and the garden, the castle lost its defensive character[7].

The castle was badly damaged during the Swedish invasion in 1656, after which another, smaller, renovation took place. Unfortunately, the Swedish destroyed the castle completely in 1704. They blew up the dwelling house and defensive wall so that Polish troops could not use the fortress any more. Traces of these explosions were discovered during excavations. The castle was never rebuilt. The walls were gradually taken down in the eighteenth and the nineteenth centuries. Only a large tower and two fragments of the defensive wall have survived up to our times[8].

The archaeological examinations of the castle in Bolesławiec on the Prosna were conducted by an

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[3] *Zamki środkowopolskie (The Castles of Central Poland)*, part 2, *Bolesławiec nad Prosną (Boleslawiec on the Prosna)*, ed. T. Poklewski, Wrocław-Warsaw-Cracow-Gdańsk-Łódź 1982, pp. 23-27; T. Poklewski-Koziełł, *Średniowieczne zamki...*, p. 17; M. Żemigała, T. Poklewski, *Próba odtworzenia zmian w zabudowie zamku w Bolesławcu nad Prosną w woj. kaliskim w ciągu wieków od XIV do XVII (An Attempt at the Reconstruction of Changes in the Structure of the Castle in Bolesławiec on the Prosna in Kalisz Province from the 14th to 17th Century)*, „Rocznik Kaliski", vol. 14, 1981, pp. 16-17.

[4] *Zamki środkowopolskie...*, pp. 27-40; T. Poklewski-Koziełł, *Średniowieczne zamki...*, pp. 17-18, 61.

[5] *Zamki środkowopolskie...*, pp. 37-40, T. Poklewski-Koziełł, *Średniowieczne zamki...*, p. 63; by the same author, *Rubież Prosny...*, pp. 120-121, Note 341; J. Szymczak, *Organizacja produkcji i ceny uzbrojenia (The Organization of Production and the Prices of Arms and Armour)*, [in:] *Uzbrojenie w Polsce średniowiecznej 1350-1450 (Arms and Armour in Medieval Poland)* ed. A. Nadolski, Łódz 1992, pp. 287-289.

[6] *Zamki środkowopolskie...*, pp. 41-51; M. Żemigała, *Ogrzewanie piecowe na zamku w Bolesławcu nad Prosną XIV-XVII w. (The Stove Heating at the Castle in Boleslawiec on the Prosna 14th-17th Centuries)*, Łódz 1987, pp. 63-66; M. Żemigała, T. Poklewski, *op. cit.*, pp. 17-18.

[7] *Zamki środkowopolskie...*, pp. 52-56; M. Żemigała, *Ogrzewanie piecowe...*, pp. 67-68; M. Żemigała, T. Poklewski, *op. cit.*, pp. 17-19; M. Żemigała, *„... salsamenta omnia, muriaticam... divendere". Przyczynek do znajomosci handlu „owocami morza" w XVI i XVII . (A Contribution to the Knowledge about the Trade in sea friuts in the 16th and 17th Centuries)*, [in:] *Archeologia i starożytnicy. Studia dedykowane Profesorowi Andrzejowi Abramowiczowi w 70 rocznice urodzin (Archaeology and the Antiquarians. Studies Dedicated to Professor Andrzej Abramowicz on His 70th Birthday Anniversary)*, Łódź 1970, pp. 325-329.

[8] *Zamki środkowopolskie...*, pp. 62-64; M. Żemigała, *Ogrzewanie piecowe...*, pp. 68-70.

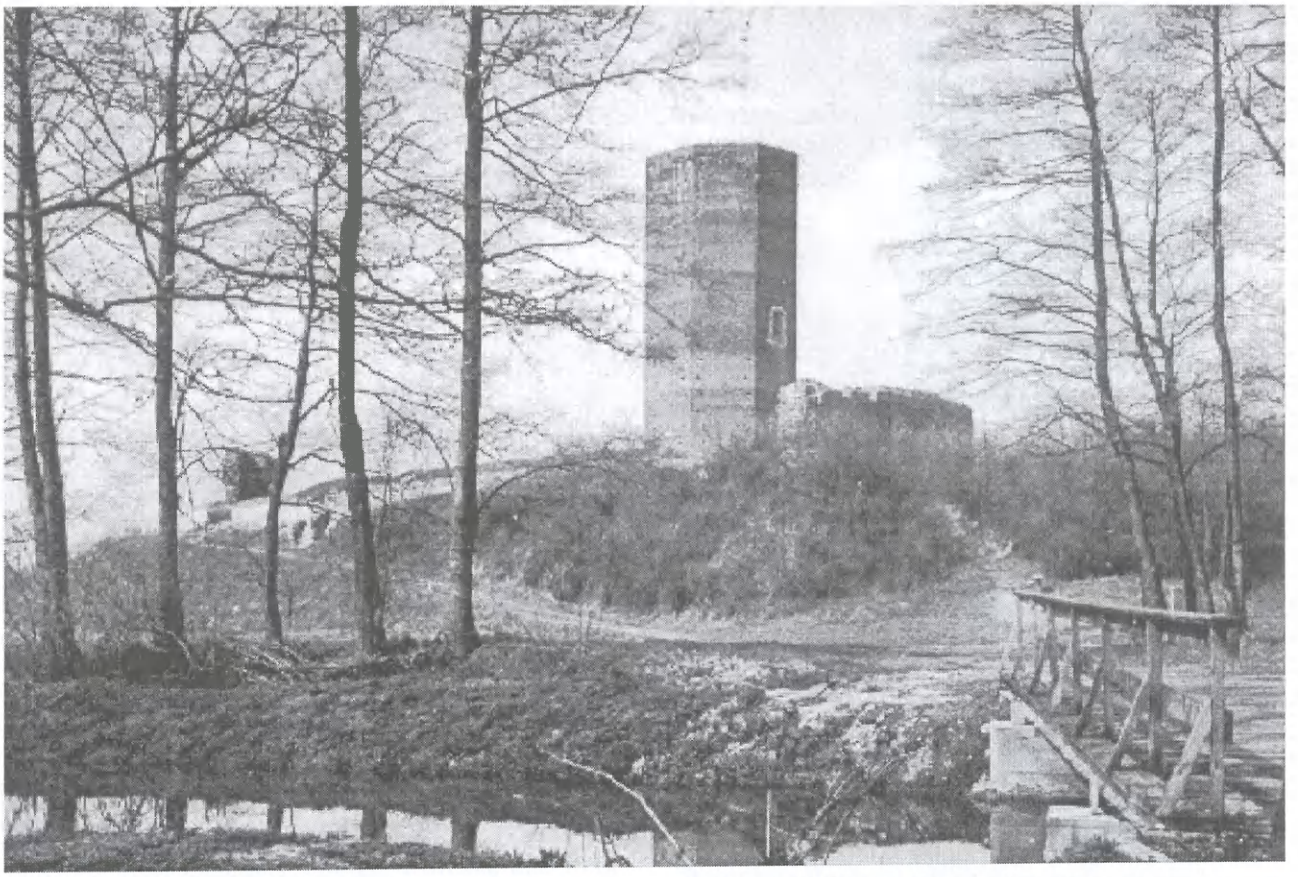


Fig. 3. North-eastern view of the ruins (Photo by K. Karpińska).

expedition organized by the Central Poland Archaeological Centre of the Material Culture History Institute of the Polish Academy of Sciences[9] headed by Tadeusz Poklewski. About 10 per cent of the area contained within the defensive wall were examined. Nearby areas outside the castle, namely the ramparts, the farm yard and the road leading to the castle were tested.

The excavation works revealed the stratigraphy of the castle hill formed by sets of archaeological layers. The first set consists of natural layers and the earth with which the drainage trench dug before building the defensive wall was subsequently filled up. Therefore these layers date back to a period before the building of the castle and were formed in 1336 at the latest. The second set is composed of the strata connected with erecting and using phase I of the castle, building phase II, as well as the damage caused by Władysław Jagiełło's troops. The set comprises the defensive wall foundation trench, defensive wall building strata, rampart strata, courtyard use strata, as well as the earth with which the tower and the dwelling house foundation trenches were filled up, their building strata and the house destruction layer. The set should be dated at the period from 1336 to 1401. The third stratigraphic set is composed of the layers formed as a result of repairs carried out on the castle after the war damage of the end of the fourteenth century and the castle use strata dating from the fifteenth, sixteenth and the beginning of the seventeenth centuries. Ceramic flooring laid in the years 1615-1628 separates the layers mentioned above from the younger ones. Thus the set can be plausibly dated at the period between 1401 and 1615. The last, fourth, stratigraphic set consists of the layers found between the above-discussed flooring and the damage strata dating back to 1704 and the layers connected with the later demolition of the castle walls. In some parts of the castle there are strata which can be dated more precisely, for instance, at the period between laying the flooring and the destruction of the castle in 1656 and the renovation which followed the event and lasted until at least 1664[10].

Thanks to the archaeological works, besides other finds, the elements of arms and armour, horse-furniture and riding equipment which are the subject of the present study were found. They were discovered in all the stratigraphic sets, except the first one, that is, they were not discovered in the layers older than the strata connected with building the defensive wall.

Some defensive arms, such as lames of a coat of plates, so-called plates, and a fragment of a steel gauntlet, were also unearthed. Among the offensive

[9] Today: The Institute of Archaeology and Ethnology of the Polish Academy of Sciences Branch in Łódź

[10] *Zamki środkowopolskie...*, pp. 69-70.

arms discovered at the castle, there were a sword pommel, battle axes, a lance-head, projectile weapon heads, stone bombard balls, and iron handgun balls. A number of objects connected with the horse and the rider were found on the site, too. These were snaffle bits, a curb bit, a stirrup, horseshoes and spurs.

Defensive Arms

The Armour Plates (Lames)

Fragments of two lames were found in Bolesławiec. One of them (inv. no. 1218/78) is 160 mm long and 70 mm wide, the other about 75 mm long and 32 mm wide. The lames are about 3 mm in thickness. There are no rivets nor rivet openings in the plates. It must, however, be remembered that only fragments of the lames have survived. Both the finds were discovered in the courtyard use stratum under the paving laid in the fifteenth or at the beginning of the sixteenth century at the latest (Fig. 4).

The suit of armour in the form of a textile or leather jacket with iron or steel lames riveted to the inside is referred to as a lame cuirass or, recently, a pair of plates (this term was used in the Middle Ages) in the scientific literature[11]. This type of armour was in use from the thirteenth to the beginning of the fifteenth century[12]. Remnants of such suits of armour were discovered in a post-battle grave on Gotland (1361)[13], in Siedlątków in central Poland (c. 1380)[14], in Nowe Miasto-upon-Warta in Great Poland (second quarter of the fourteenth century)[15] and in Plemieta in the District of Chełmno, that is, in Teutonic State territory (beginning of the fifteenth century)[16]. Representations of such suits of armour can also be found in thirteenth and fourteenth century iconography, for instance, in a wall painting in the basilica in Assisi

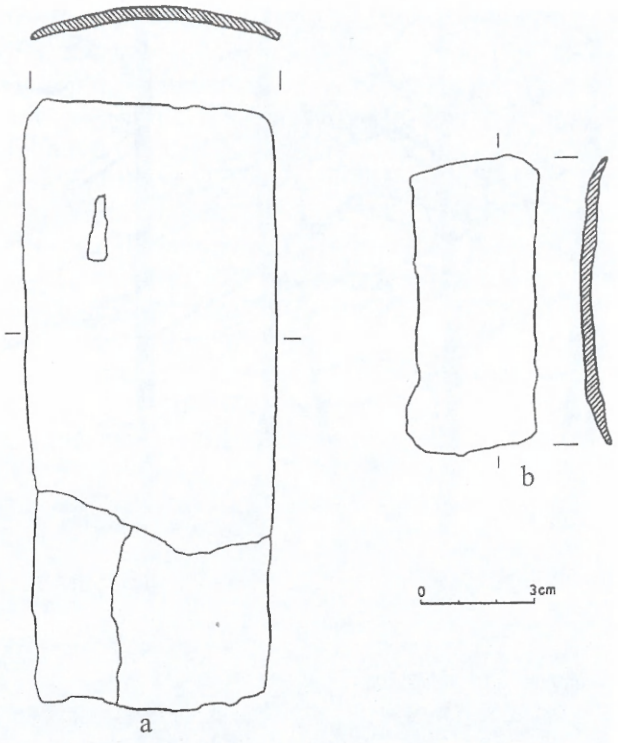


Fig. 4. Lames: a. inv. no. 1218/78, b. inv. no. 1174/72 (Illustrated by E. Wtorkiewicz-Marosik).

(1333-1336), on tombstones in Mnsterfeld and Bobfingen in Germany (first half of the fourteenth century) and on some Silesian dukes' seals, for example, the seals of Henry the Pious (1228-1234), Bernard of Świdnica (1307-1325), Bolesław II of Ziębica (1324-1332) and Przemysław, son to Ziemnomysłowic, Duke of Cuiavia (c. 1307), as well as on the seal of the City Council of Cracow (1329)[17].

In the case of the Bolesławiec lames, no remnants of fabric or leather, to which the laminations had been attached, were found. Fortunately, the relic from Nowe Miasto gives us an idea of how the jacket covering the plates might have looked like. On one of the plates, under a rivet, there was a small remnant of mineralized cloth[18]. The sample was not analysed, but the photograph shows a piece of thick fabric, probably a 1/1 tabby, with fewer than 10 threads per 1 cm.

It seems that the Bolesławiec lames come from one or two suits of armour made in the fourteenth or around the turn of the fourteenth century which might have been still in use in the fifteenth century.

The Steel Gauntlet

A fragment of a gauntlet was found outside the castle, in the layer being the remnants of artillery earthworks, from which the castle was bombarded at the siege of 1393[19].

[11] A. Nowakowski, *Uzbrojenie ochronne (Defensive Arms)*, [in:] *Uzbrojenie w Polsce...*, p. 64.

[12] Ibidem, pp. 64-65.

[13] B. Thordemann, *Armour from the Battle of Visby 1361*, Stockholm-Uppsala 1939-1940, vol. 1, pp. 216-217, vol. 2, table 1, pp. 85-89.

[14] A. Nadolski, *Helm i fragmenty zbroi z Siedlątkowa (The Helm and Fragments of Armour from Siedlatkow)*, „Prace i Materiały Muzeum Archeologicznego i Etnograficznego w Lodzi", archaeological series, vol. 15, 1968, pp. 89-93.

[15] R. Grygiel, T. Jurek, *Doliwowie z Nowego Miasta nad Warta, Dębna i Biechowa. Dzieje rezydencji i ich właścicieli (The Doliwowie from Nowe Miasto-upon-Warta, Dębno and Biechowo. The History of the Residences and their Owners)*, Łódź 1996, pp. 84-90, Figs. 71-103.

[16] A. Nadolski, E. Grabarczykowa, *Militaria z grodziska w Plemiętach. Uzbrojenie ochronne (Military Accessories from the Motte in Plemięta. The Defensive Arms)*, [in:] *Plemięta. Sredniowieczny gródek w ziemi chełminskiej (Plemięta. A Medieval Stronghold in the District of Chełmno)*, ed. A. Nadolski, Warsaw-Poznań-Toruń 1985, pp. 87-91.

[17] A. Nowakowski, *Uzbrojenie ochronne...*, pp. 64-65.

[18] R. Grygiel, T. Jurek, *op. cit.*, Fig. 74:4.

[19] *Zamki środkowopolskie...*, pp. 39-40; T. Poklewski-Koziełł, *Średniowieczne zamki...*, p. 63.

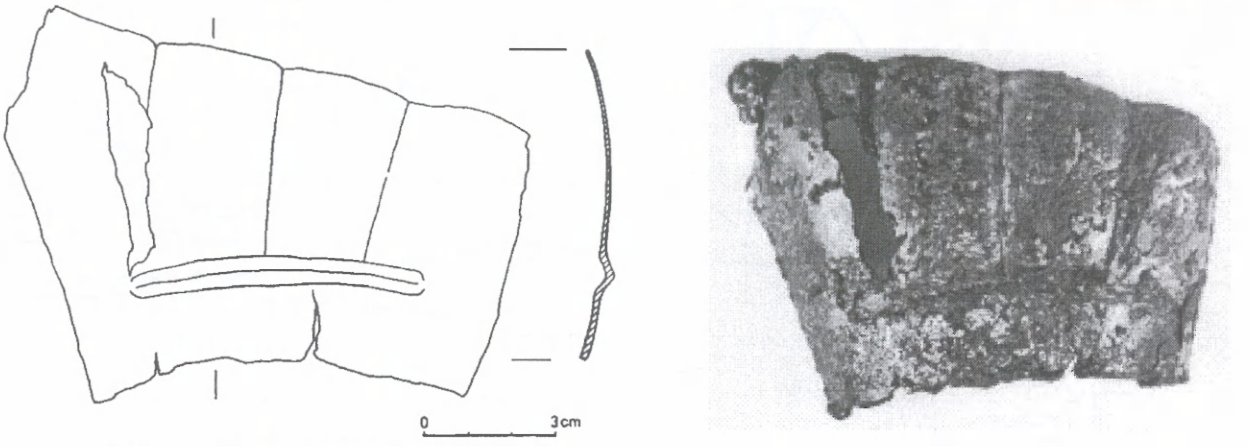


Fig. 5. Steel gauntlet inv. no. 107/77 (Illustrated by E. Wtorkiewicz-Marosik, photo by K. Karpińska).

This is the part of the gauntlet which protects the metacarpus. It is made of a steel, engraved plate about 1-2 mm in preserved thickness with traces of tinning. The gauntlet had been specially shaped to fit the form of the hand (Fig. 5).

It seems that fragments of a similar gauntlet were found together with the armour lames in Nowe Miasto-upon-Warta. Thus they can be dated at the second quarter of the fourteenth century. These are finger defences[20]. Steel gauntlets younger than the one from Bolesławiec and dated at the sixteenth century were discovered at the castle in Inowłódz in central Poland[21].

Similar gauntlets, dating from the years 1380-1390, are also known in Western Europe. Pieces of armour made by Italian masters signed as AN or AM and P, IO, as well as others need mentioning here[22].

Steel gauntles are rarely depicted in Polish medieval iconography. They can, however, be found in, among others, the „Coronation of Madonna" triptych from Wieluń (c. 1450-1460) and in the Triptych of the Holy Trinity from Wawel Cathedral in Cracow (c. 1467)[23]. On the basis of written sources, by contrast, it may be assumed that gauntlets were in widespread use[24].

Therefore it seems that the gauntlet from Bolesławiec was stratigraphically rightly dated at the close of the fourteenth century and that it might have been used by one of the warriors attacking the castle.

[20] R. Grygiel, T. Jurek, *op. cit.*, p. 87, Fig. 101:1-4.

[21] J. Augustyniak, *Gantelet - fragment d'armure datant du XVIe siecleet provenant du château d'Inowłódz dép. de Piotrkow (Pologne Centrale)*, „Fasciculi Archaeologiae Historicae", fasc. 2, 1987, pp. 7-9.

[22] L. G. Boccia, E. T. Coelho, *L'arte dell'armatura in Italia*, Milano 1967, Figs. 7-11; J. G. Mann, *Fourteenth-Century Gauntlets*, „Connoisseurt", August 1941, p. 69, Figs. 1, 2: by the same author, *Two Fourteenth-Century Gauntlets from Ripon Cathedral*, „The Antiquaries Journal", [London] 1942, vol. 22, pp. 113-121.

[23] A. Nowakowski, *Uzbrojenie ochronne...*, p. 82, Figs. 78-79.

[24] Ibidem, pp. 81-82.

Offensive Arms

The Sword Pommel

The iron sword pommel in the form of a rectangular prism with rounded angles (69 x 49 x 43 mm) was unearthed in the fourteenth century courtyard use strata[25] (Fig. 6).

The pommel resembles pommels of type H2, according to R. E. Oakeshott's classification with supplements by M. Głosek[26] and it seems to belong to this type. Pommels of type H2 appeared at the end of the thirteenth century and were used until the middle of the fifteenth century. They were to be found in swords of types XIII, XVI and XVII[27].

Therefore the find can be dated at the fourteenth century.

The Battle Axes

At the castle in Bolesławiec, one battle axe and fragments of five others were found[28]. Among the fragments of battle axes only one specimen, namely battle axe 1514/72, which is well preserved, can be the subject of a typological analysis. In the case of the other weapons, only fragments of the blades have survived, which makes it impossible for the researcher to identified the axe type. The fragments of axes inv. nos. 1154/73 and 1147/77 come from the layers dated at the fourteenth century and the remaining relics were found in the strata dated to the period from the fifteenth to the seventeenth century[29].

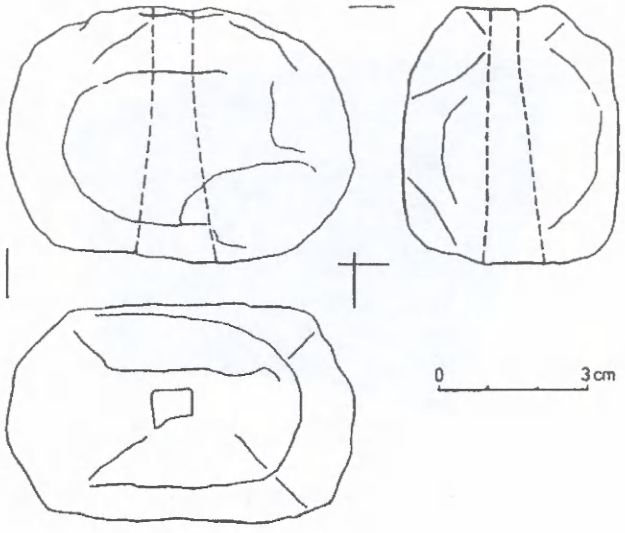
[25] *Zamki środkowopolskie...*, p. 33.

[26] R. E. Oakeshott, *The Sword in the Age of Chivalry, London 1964*, pp. 80-111; M. Głosek, *Miecze środkowoeuropejskie z X-XV w. (Central European Swords of the 10th-15th Centuries)*, Warszawa 1984, p. 34.

[27] Ibidem, pp. 34, 139, 156, 163, 172.

[28] Inv. nos. 1155/73 and 1514/72, 1051/73, 1154/73, 1147/77, and 1085/78.

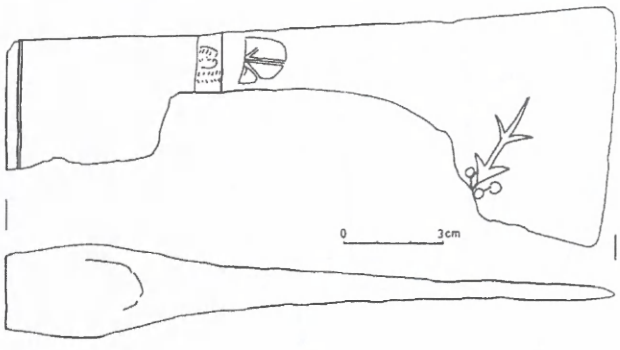
[29] *Zamki środkowopolskie...*, pp. 34, 69-70.



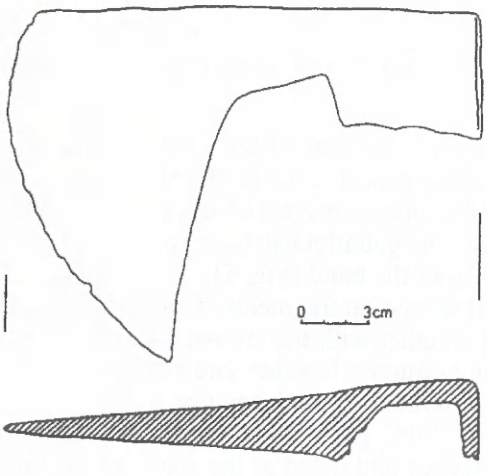
a

b

Fig. 6. Sword pommel inv. no. 1258/75 (Illustrated by E. Wtorkiewicz-Marosik, photo by K. Karpińska).



a



b

Fig. 7. Axes: a. inv. no. 1155/73, b. inv. no. 1514/72 (Illustrated by E. Wtorkiewicz-Marosik).

The most interesting find is axe inv. no. 1155/73 (Fig. 7a). It belongs to type VIIIa, according M. Głosek's typology[30]. It is 184 mm in overall length, the cutting edge is 74 mm wide. It has a minimum shank breadth of 17 mm and the butt-end is 39 mm long. On the top of the weapon there is the black smith's mark made with a stamp. The axe is decorated with ornament. It is an escutcheon with an arrow made of coloured metal. The blade is overlaid with ornament in the shape of a twin-spiked arrow. Next to it there are three little hollows.

Axes of Type VIIIa (M. Głosek singles out eight such specimens) may be both a dangerous weapon and a tool used in carpentry. They can be dated to the period from the middle of the thirteenth century to modern times[31]. This long time span renders any precise dating of the Bolesławiec axe impossible.

Another battle axe (inv. no. 1514/72), which does not have one of the butt-end walls, belongs to type IX, according to M. Glosek's classification[32]. It is 208 mm in overall length, the cutting edge is 166 mm wide. It has a minimum shank width of 30 mm and the butt-end is 58 mm in length (Fig. 7b).

Axes of Type IX, which are numerous in Polish collections (45 specimens published by M. Głosek) cannot be precisely dated, either. They could be used from the mid-thirteenth century to modern times[33]. Such tools could be handy in battle. They seem, however, to have been originally used for chopping wood[34].Similarly, we cannot date this specimen to a definite period of time. It might have been in use in the fourteenth, fifteenth, sixteenth or seventeenth century.

[30] M. G ł o s e k, *Późnośredniowieczna broń obuchowa w zbiorach polskich (Late Medieval Butt Weapons in Polish Collections)*, Warszawa-Łódź 1996, pp. 39-40.

[31] Ibidem, pp. 39-40, 80.

[32] M. G ł o s e k, *Późnośredniowieczna broń...*, pp. 40-42.

[33] Ibidem, pp. 40-42, 80.

[34] Ibidem, p. 42.

The Lance-Head

The iron lance-head was found in an excavation in the road leading to the castle, in the humus layer under the turf. The blade lance-head is flat, nearly lenticular, in cross-section. It is 27 mm long, 7 mm thick, and 100 mm in preserved length (the point of the lance-head is broken). The socket is broken, too. It is 67 mm long and the outlet is 32 mm in diameter. Thus, the lance-head is 167 mm in preserved length, but originally it must have been over 180 mm long (Fig. 8).

The lance developed during the twelfth century from the spear, which was gradually remade to pierce new improved suits of armour. The lance-head assumed the form of a massive, „stocky" spike, the socket was usually longer than the blade. Its outlet had to be wide enough for a thick shaft to be inserted into it[35].

The closest analogue of the lance-head from Bolesławiec known to me is the find from the conical motte in Siedlątków on the Warta, dated at about 1380[36]. Another lance-head, dated to the late Middle Ages, comes from an archaeological site in Gdansk[37]. Recently, a lance-head was discovered on Biśnik Rock in Jura Krakowsko-Częstochowska (the Cracow-Częstochowa Jura), where, at the end of the thirteenth century and the first half of the fourteenth century, was most probably a little defensive tower[38]. A lance-head was also found in Warsaw, in the old Vistula River bed „Na Kamionku". A couple of lance-heads coming from Great Poland and Silesia are stored in museums. However, their precise localization and dating remain unknown[39].

All the lance-heads are longer than the relic from Bolesławiec. They are from 225 mm to 313 mm long and the sockets are longer than the blades. The socket of the lance-head from Bolesławiec is much shorter than the blade, but it may be assumed that it was originally longer than the blade. Then the lance-head would be over 22 cm long and would not differ from the others.

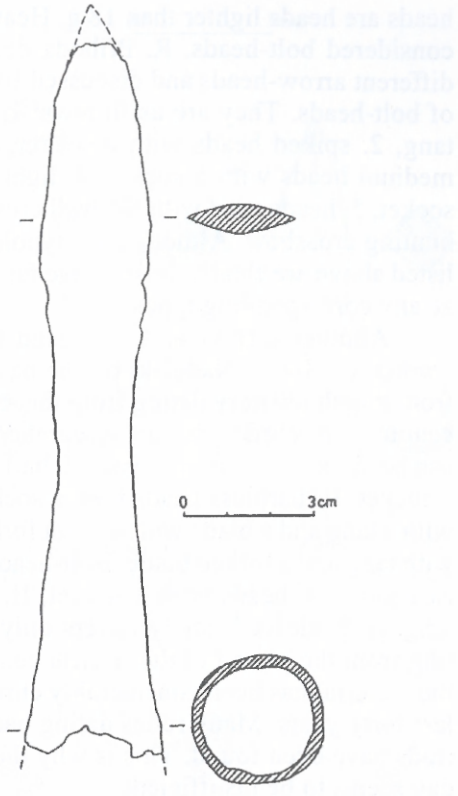


Fig. 8. Lance-head inv. no. 14/79 (Illustrated by E. Wtorkiewicz-Marosik, photo by K. Karpińska).

The lance-head described above cannot be dated more precisely. We can only hypothesize that it is a medieval relic.

The Arrow- and Bolt-Heads

The projectile weapon heads are the most numerous group of military accessories (97 specimens) found on the archaeological site in Bolesławiec. However, because of the state of preservation, only 67 relics could be the subject of a formal analysis. Such heads are numerous on other medieval sites in Poland and this may be the reason why no comprehensive studies have yet been made.

The oldest projectile weapon head typology known to me is the typology worked out in the 1930s by R. Přihoda on the basis of head finds from Bohemia, Moravia and Silesia[40]. The basic criteria for this typology were the fact that a head was equipped with a socket or a tang, the shape of the blade and the weight of the head. According to the researcher, arrow-

[35] M. Głosek, *Broń drzewcowa i obuchowa (Pole and Butt Arms)*, [in:] *Uzbrojenie w Polsce...*, pp. 134-135.

[36] J. Kamińska, *Siedlątków - obronna siedziba rycerska z XIV w.. (Siedlątków - A Defensive Knightly Seat of the Fourteenth Century)*, „Prace i Materialy Muzeum Archeologicznego i Etnograficznego w Łodzi", archaeological series, No. 15, 1968, table XIV, Fig. 10. According to J. Kamińska, the find is a spear-head. M. Głosek, by contrast, believes that this is rather a lance-head, because the length of its socket is one and a half the length of the blade (M. Głosek, *Broń drzewcowa...*, Fig. 26).

[37] *Broń średniowieczna z ziem polskich. Katalog Wystawy w Państwowym Muzeum Archeologicznym (Medieval Arms from Polish Territory. The Catalogue of the Exhibition at the State Archaeological Museum)*, ed. A. Nadolski, Łódź 1978, p. 40, table 26.

[38] B. Muzolf, *Badania na skale z jaskinią Biśnik i na górze Grodzisko Pańskie w Strzegowej, woj. katowickie (Archaeological Works on the Rock with Biśnik Cave and the Mountain Grodzisko Pańskie [Lord's Stronghold] in Strzegowa, Katowice Province)*, „Łódzkie Sprawozdania Archeologiczne", vol. 2, 1996, p. 124, Fig. 10:1.

[39] Ibidem, pp. 40-41.

[40] R. Přihoda, *Zur Thypologie und Chronologie mittelalterlicher Pfeilspitzen und Armbrustbolzeneisen*, „Sudeta", vol. 8, 1932, pp. 43-67.

heads are heads lighter than 18 g. Heavier heads are considered bolt-heads. R. Přihoda described seven different arrow-heads and discussed five basic types of bolt-heads. They are as follows: 1. heads with a tang, 2. spiked heads with a socket, 3. heavy and medium heads with a socket, 4. light heads with a socket, 5. heads used with the wall crossbow and the hunting crossbow. Although the typological criteria listed above are clearly defined, we failed to recognize any corresponding types.

Another arrow- and bolt-head typology was worked out by A. Nadolski on the basis of material from Polish territory dating from the tenth to twelfth century[41]. According to this researcher, arrow-heads can be classified into four types: I. barbed heads with a socket, II. barbless heads with a socket, III. heads with a tang and a blade which is not forked, IV. heads with tang and a forked blade. Bolt-heads fall into two categories: I. heads with a socket, II. heads with a tang. A. Nadolski's study covers only the finds dating from the period to the twelfth century. Besides, the material has been considerably enriched over the last forty years. Many relics dating back to later periods have been found. This is why the typology today seems to be insufficient.

A separate typology was prepared to classify the arrow- and bolt-heads found in Tum near Łęczyca. It comprises nine types of heads, depending on whether a relic is equipped with a socket or tang, the shape of the blade (barbed, laurel-shaped, rhomboidal or nail-shaped) and the size[42].

Nadolski's typology was used by K. Wachowski in his studies of heads from Opole. For him, however, the basic criterion was the weight of the relics, which could help establish the kind of weapon the arrow- or bolt-heads were shot from. This was the way he identified seven types of finds[43].

Other large sets of projectile weapon heads which have been published come from late medieval mottes in Plemięta (beginning of the 15th century) and Słoszewy (second part of the 14th-first half of the 15th century), that is to say, from Prussian territory[44]. The head typologies worked out separately for each of those sets will be not of much use in my study, because all the heads found in Plemięta and nearly all the relics from Słoszewy were equipped with a tang. In Bolesławiec, by contrast, only 5 heads have tangs and the rest sockets.

A large set of bolt-heads comes from Nowe Miasto-upon-Warta. They are stuck in a wall of a timber tower, which according to the authors of the relevant study, was burnt down by means of burning bolts. As the heads were seriously damaged by fire corrosion and very generally described it is only known that more than 90 of them were equipped with a socket and 5 with a tang[45].

It may also be noted that an Alsatian heads typology was recently worked out by Ch.-L. Salch[46]. As all the heads discussed by him have sockets, the only criteria for classification were the size of a head the and shape of the blade.

The discovery in Legnica, where several hundred complete crossbow bolts and bolt-heads were found, needs mentioning here. The cache is of paramount importance to bolt construction and production research[47].

None of the projectile weapon head typologies discussed above includes all head forms used in the Middle Ages. I believe that such a typology ought to be based on the largest material possible, coming from all parts of Poland. It seems that the basic criteria for division should be as follows: 1. the presence of a socket or tang, 2. the shape of the blade, 3. the size and mass of the head.

As the set of projectile weapon heads found in Bolesławiec cannot serve as a basis for such a universal typology I have decided to classify the finds into rough types only for use in this study.

The Heads with a Socket

Type I

These are large, massive heads with a socket and a blade of square cross-section, whose longest diagonal is 15 mm long at the minimum. They have a mass of 27-60 g[48].

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[41] A. Nadolski, *Studia nad uzbrojeniem polskim w X, XI i XII w. (Studies into Polish Arms and Armour in the 10th, 11th and 12th Centuries)*, Łódź 1954, pp. 64-67.

[42] T. Poklewski, *Zabytki lokalizowane pojedynczo (The Singly Localized Finds)*, [in:] *Łęczyca wczesnośredniowieczna (Early Medieval Łęczyca)*, vol. 3, a typed copy at the Archives of the Institute of Archaeology and Ethnology of the Polish Academy of Sciences Branch in Łódź.

[43] K. Wachowski, *Średniowieczna broń miotająca na Śląsku w świetle znalezisk z Ostrówka w Opolu (Medieval Projectile Throwing Weapons in Silesia in the Light of Finds from Ostrówek in Opole)*, „Archeologia Polski", vol. 27, fasc. 1, 1982, pp. 167-198.

[44] A. Kola, G. Wilke, *Militaria z grodziska w Plemiętach. Broń strzelcza (Military Accessories from the Motte in Plemięta. The Projectile Weapons)*, [in:] *Plemięta. Średniowieczny gródek...*, pp. 107-128; by the same authors, *Zespół grotów beltow do kusz z grodziska późnośredniowiecznego w Słoszewach koło Brodnicy w świetle odkryć z 1973 r. (The Set of Crossbow Bolt-Heads from the Late Medieval Stronghold in Słoszewy near Brodnica in the Light of the Discoveries of 1973)*, „Zapiski Historyczne", vol. 41, fasc. 1, 1976, pp. 81-123.

[45] R. Grygiel, T. Jurek, *op. cit.*, pp. 90-91, Figs. 105-111.

[46] Ch. - L. Salch, *La clef des Châteaux Forts d'Alsace. Dictionnaire*, Lichtenberg 1995, pp. 18-19.

[47] M. Lewandowski, *L'atélier du flécher, dans la tour de pierre au château de Legnica*, „Fasciculi Archaeologiae Historicae", fasc. 1, 1986, pp. 49-53.

[48] The original mass of the heads might have been bigger and their different present masses may result from corrosion, damage and conservation.

Ia (Fig. 9)

The blade diagonal of this type of head is longest at one-half its length and it is from 15 to 22 mm long. The sockets are thick. Their outlets are 12-16 mm in outer diameter. The heads are from 62 to 88 mm in length, but most of the relics are about 80 mm long. Only two heads are much shorter. They are 62 and 72 mm long.

In Bolesławiec, 10 heads of type Ia were found. One of them was discovered in the fourteenth century stratum, two of them in the fifteenth century stratum, six of the relics in the layers dating from the 15th-17th centuries. One of the heads was found on the road leading to the castle.

Ib (Fig. 10)

These heads differ from the specimens described above, because their blade is thickest at the point (at one-quarter or one-third of the blade's length). The longest blade diagonal is from 15 to 20 mm long and the outlet of the socket is 12-17 mm in diameter. The length of the heads varies from 65 to 82 mm (they are usually about 78 mm long).

In Bolesławiec 9 heads of type Ib were found. Two of them were discovered in the fourteenth century stratum and the others in the 15th-17th century ones.

Ic (Fig. 11)

Type Ic resembles type Ia, but the socket is very narrow – under 10 mm. Two such heads were unearthed at the castle in Bolesławiec. Unfortunately, one of the sockets is broken. The diagonals of the blades are 17 and 20 mm long, the socket's outlet is 9 mm in diameter, and the head is 83 mm in overall length.

One of the heads comes from a layer dating from the first half of the fifteenth century at the earliest and the other from the seventeenth century stratum.

Type II

Type II resembles Type I. The heads are large, massive and equipped with a socket, but the cross-section of the blade is rhomboidal in shape. The diagonal is longest at one-half the length of the blade and it is 15 mm long at the minimum. The mass of the heads resembles the mass of type I and usually varies from 28 to 62 g. However, some of the heads are heavier (72-86 g.).

IIa (Fig. 12)

The blade is thickest at one-half the length of the head. The longer diagonal is 15-25 mm long and the shorter from 7 to 16 mm in length. The sockets' outlets are 15-17 mm in diameter. The length of the

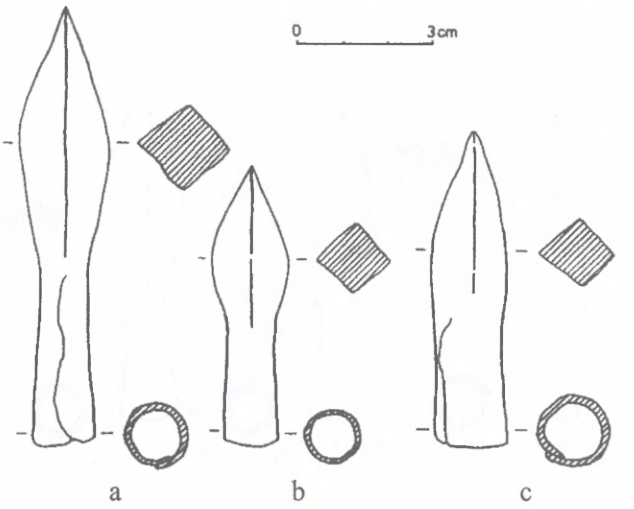


Fig. 9. Projectile weapon heads of type Ia: a. inv. no. 1051/78, b. inv. no. 1448/72, c. inv. no. 113/76 (Illustrated by E. Wtorkiewicz-Marosik).

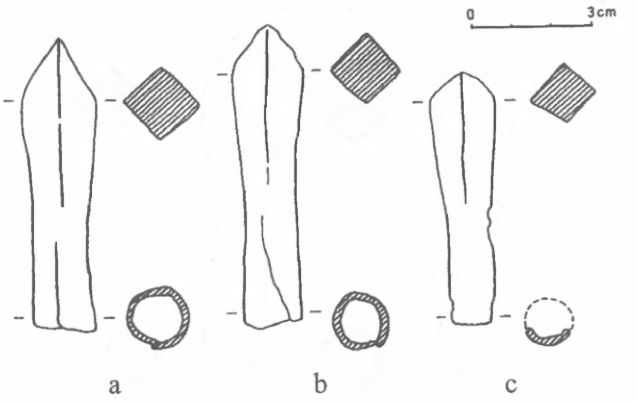


Fig. 10. Projectile weapon heads of type Ib: a. inv. no. 1119/78, b. inv. no. 1236/74, c. inv. no. 1497/72. (Illustrated by E. Wtorkiewicz-Marosik).

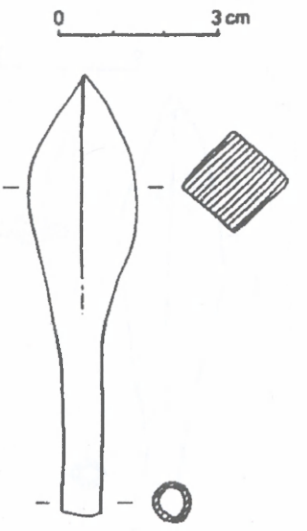


Fig. 11. Projectile weapon head of type Ic inv. no. 1519/72 (Illustrated by E. Wtorkiewicz-Marosik).

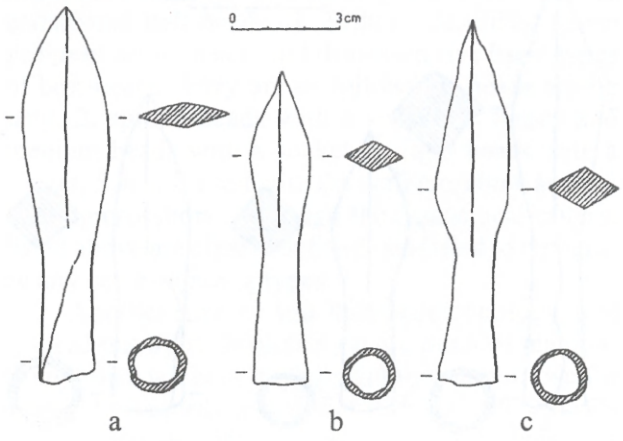


Fig. 12. Projectile weapon heads of type IIa: a. 1122/78, b. inv. no. 48/79, c. inv. no. 1337/72 (Illustrated by E. Wtorkiewicz-Marosik).

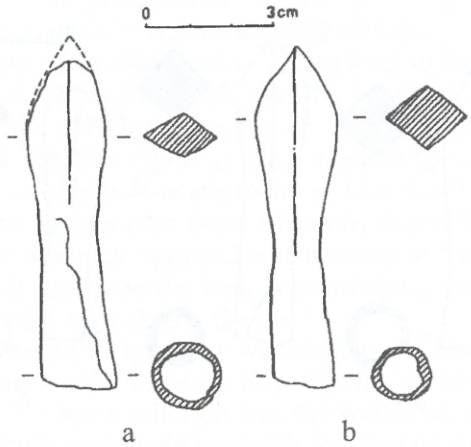


Fig. 13. Projectile weapon heads of type IIb: a. inv. no. 1123/75, b. inv. no. 1018/77 (Illustrated by E. Wtorkiewicz-Marosik).

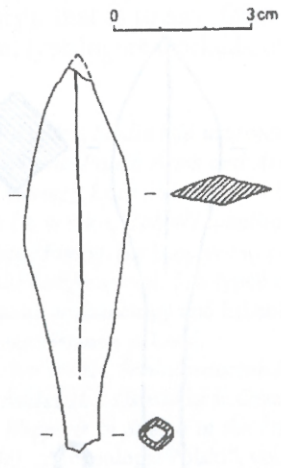


Fig. 14. Projectile weapon head of type IIc inv. no. 1149/73 (Illustrated by E. Wtorkiewicz-Marosik).

heads is from 75 to 108 mm, on average about 90 mm. The blade of one of the heads is particularly broad and flat (25 x 7 mm).

In Bolesławiec, type IIa is the most numerous group of heads, comprised of 15 specimens. One of them comes from the fourteenth century stratum, two of them from a layer dating back to the first half of the fifteenth century at the earliest, and the rest from the 15th-17th century strata.

IIb (Fig. 13)

This type resembles type IIa, but the blades are thickest at about one-fourth or one-third of the length. The longer diagonal of the blade is from 15 to 19 mm long and the length of the shorter varies from 11 to 15 mm. The sockets are thick (15-17 mm), only one socket is narrower (12 mm). The heads are from 76 to 80 mm in length.

Four such heads were discovered on the site in Bolesławiec. One of them was discovered in the fourteenth century stratum and the rest comes from the layers dated at the 15th-17th centuries.

IIc (Fig. 14)

Type IIc differs from type IIa, because it is equipped with a narrow socket under 10 mm in diameter. One of the two heads of this type found in Bolesławiec has a blade whose diagonals are 17 and 14 mm long, the blade of the other head is extremely flat (the diagonals are 23 and 7 mm long). In the case of one of the heads the socket's outlet is 9 mm in diameter and the socket of the other is untypical, because its cross-section is rhomboidal in shape (the diagonals are 10 and 7 mm long). The lengths of the heads are 74 and 87 mm (the latter must have been longer, because its socket is broken).

Both the heads were found in the seventeenth century modern strata.

Type III

These are slender heads of square cross-section with sockets. The diagonal is under 15 mm long. This type is usually lighter than the other heads. The mass is from 25 to 40 g.

IIIa (Fig. 15)

The blades are thickest at one-half their length and the diagonals are 11-14 mm long. The outlet of the socket is from 10 to 12 mm in diameter. The heads are 66-97 mm long (the length is usually over 90 mm).

Five of the heads were found in the strata dating back to the period between the fifteenth and the seventeenth century and the layers dating from the time of the demolition of the defensive wall. One of the specimens comes from the rampart outside the castle.

IIIb (Fig. 16)

These heads are thickest at the point. In Bolesławiec, only one such head was found. The diagonal of the blade is 14 mm long and the outlet of the socket is 14 mm in diameter. The length of the head is 76 mm.

The relic comes from a layer dating from the fifteenth or the beginning of the sixteenth century.

Type IV

This type of head is particularly slender. The impression is strengthened by the shape of the blade, which is rhomboidal in cross-section and whose longer diagonal is under 15 mm long. Some of the heads are very light (the mass is about 10 g). However, most of them are heavier – from 20 to 50 g.

IVa (Fig. 17)

The blades are thickest at one-half their length. The longer diagonal is 11-14 mm long and the shorter from 3 to 10 mm in length. The sockets are thin, the outlets 7-11 mm in diameter. The heads are from 77 to 100 mm in length, on average about 90 mm. Two of these heads have extremely flat blades (the diagonals are 12 and 5 mm, and 12 and 3 mm long).

Eight such heads were found in the layers dated to the period from the fifteenth to seventeenth centuries and one relic in the fourteenth century stratum.

IVb (Fig. 18)

Type IVb resembles type IVa, but the blade is thickest at the point. The longer blade diagonal is 12-14 mm long and the shorter 3-7 mm long. The sockets are narrow, the outlets 8-10 mm in diameter. Two of the three heads of this type discovered in Bolesławiec are 79 mm long, and the third is shorter (62 mm).

All the heads come from the seventeenth century strata.

Type V (Fig. 19)

These heads are extremely long and massive. In Boles3awiec, two heads of type V were found. Their blades are square in cross-section. One of the heads is 127 mm in length. Its blade diagonal is 25 mm long, the socket's outlet 21 mm in diameter and the mass of the head 186 g. The other is still larger: it is 146 mm in length, the blade diagonal is 28 mm long, the socket's outlet 20 mm in diameter, and the mass 217 g.

Both the heads were found in the 15th-17th century strata.

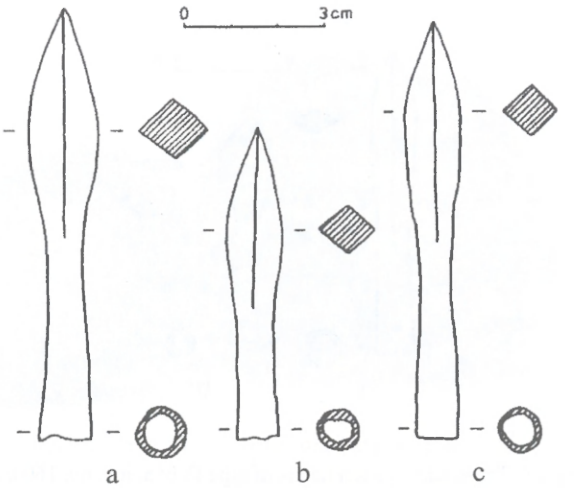


Fig. 15. Projectile weapon heads of type IIIa: a. inv. no. 1557/72, b. 1205/76, c. 1133/72 (Illustrated by E. Wtorkiewicz-Marosik).

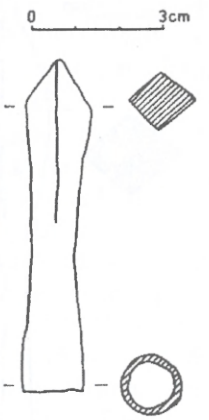


Fig. 16. Projectile weapon head of type IIIb inv. no. 1338/72 (Illustrated by E. Wtorkiewicz-Marosik).

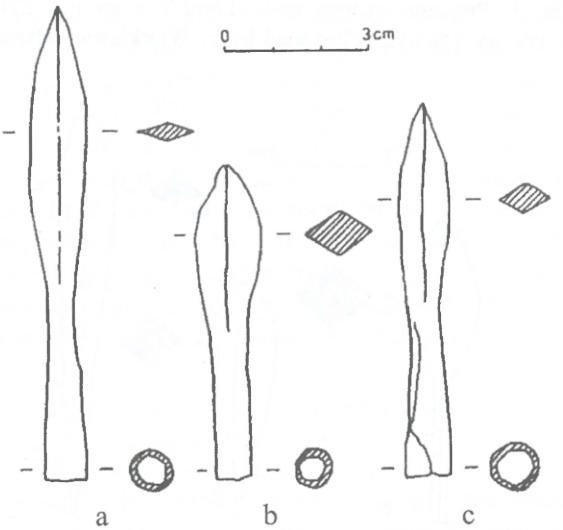


Fig. 17. Projectile weapon heads of type IVa: a. inv. no. 1159/77, b. inv. no. 1201/72, c. inv. no. 1442/72 (Illustrated by E. Wtorkiewicz-Marosik).

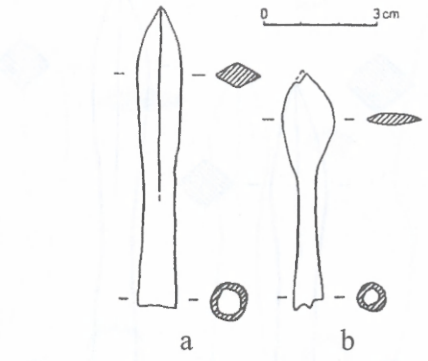


Fig. 18. Projectile weapon heads of type IVb: a. inv. no. 1604/72, b. inv. no. 1574/72 (Illustrated by E. Wtorkiewicz-Marosik).

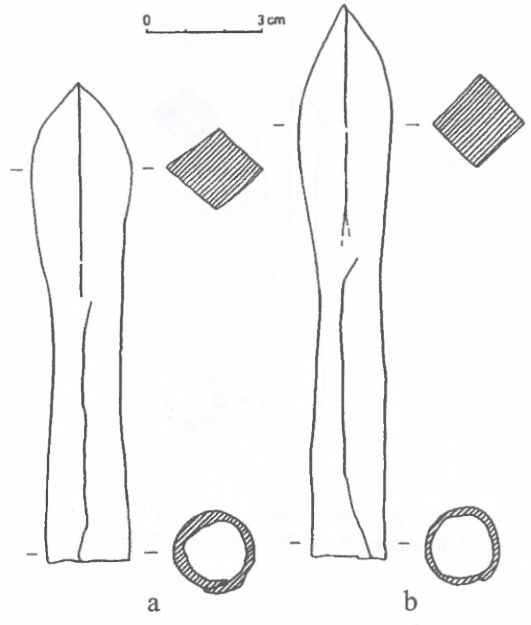


Fig. 19. Projectile weapon heads of type V: a. inv. no. 1271/72, b. inv. no. 1584/72 (Illustrated by E. Wtorkiewicz-Marosik).

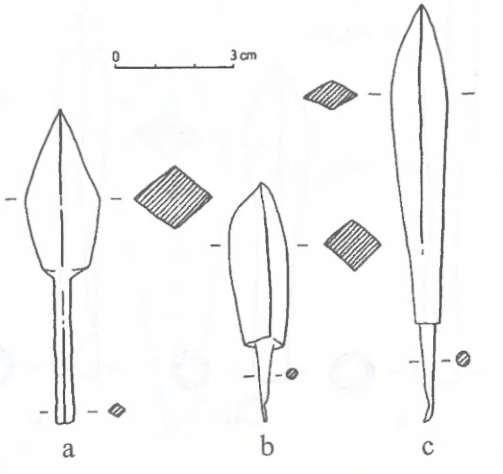


Fig. 20. Projectile weapon heads of type VI: a. inv. no. 1043/72, b. inv. no. 1311/72, c. no inv. no. (Illustrated by E. Wtorkiewicz-Marosik).

The Heads with a Tang

Type VI

This type is equipped with a tang instead of a socket and the blades do not have barbs. Each of the three heads of this type found in Boles3awiec is different and this is why they will be described as separate variations.

VIa (Fig. 20a)

This head has a massive blade, rhomboidal in cross-section, which is thickest at one-half its length. The diagonals are 21 and 18 mm long The length of the blade is 45 mm and the length of the whole head 81 mm. The tang is rectangular in cross-section.

This head was found in the rubble dating from the time of the demolition of the castle wall.

VIb (Fig. 20b)

The blade of this head, rhomboidal in cross-section, is slimmer than the blade of type VIa. Its diagonals are 16 and 15 mm long. It is thickest at the point. The length of the blade is 44 mm and the whole head is 62 mm long. The tang is circular in cross-section.

The head was found in a layer dating from the first half of the fifteenth century at the earliest.

VIc (Fig. 20c)

This is a long, slender head with a blade of rhomboidal cross-section. The diagonals are 13 and 8 mm long. The blade is thickest at the point. The blade is 83 mm in length and the length of the whole head is 109 mm. The tang is circular in cross-section. The head comes from the turf layer.

The heads described above were found in the strata dating from the end of the 1330s to the close of the seventeenth century, that is to say, from the whole period when the castle was in use, and the layers coming from the demolition of the castle wall. The bow and the crossbow were in use both in the Middle Ages and in modern times, though from the sixteenth century onwards, the crossbow was used only for hunting[49]. It seems clear that the heads found in the fourteenth and the fifteenth century strata come from contemporary weapons. They may have been lost by the inhabitants of the castle or shot into the area contained within the defensive wall during the siege at the end of the fourteenth century. The heads from the modern, 16th and 17th century, layers may come from weapons stored and used at the castle, too. A note

[49] J. W e r n e r, *Polska broń. Łuk i kusza (Polish Arms. The Bow and the Crossbow)*, Wrocław-Warsaw-Cracow-Gdańsk 1974, pp. 46-51.

Fig. 21. Balls used with the bombard: inv. nos. 1236/77, 1120/78, 1154/78, 1237/77, 1261/75 (Photo by K. Karpińska).

made by an inspector who described the castle in 1565 seems to confirm this supposition. The inspector recorded that in the chamber under the gate, there were 200 bolt-heads and many bolts without heads[50].

The researcher finds it difficult to define the functions of particular head types and establish whether these are arrow- or bolt-heads. It may be assumed that types I and II are bolt-heads. Their size, mass and blade shape are evidence that the heads had to be shot with great force and that they were used for piercing suits of armour. Heads inv. nos. 1122/78 (type IIa) and 1149/73 (type IIc), equipped with large, flat blades, may be considered as exceptions here. They seem to be hunting heads used for killing large animals and their size suggests that they were rather bolt-heads.

It is equally difficult for the archaeologist to define the functions of types III and IV. Similar slim and light heads, though equipped with tangs, found in Plemieta were classed as arrow-heads[51]. K. Wachowski, by contrast, argues that in the case of smaller and lighter heads, the difference between the arrow- and bolt-head is very unclear. Such a head might have been a projectile for the bow or primitive crossbow. Heavier heads were projectiles for the developed crossbow[52]. This problem cannot yet be solved.

The size of the heads belonging to type VI – with a tang – seems to suggest that they are bolt-heads shot from crossbows.

Two of the heads of type V appear to be especially interesting. Their size and mass seem to be evidence that they may be bolt-heads shot from so-called wall crossbows[53]. I believe, however, that such crossbows might not have stood on the walls of Bolesławiec Castle, but might have been used at the siege of the end of the fourteenth century and shot into the are contained within the defensive wall.

[50] *Lustracja województw wielkopolskich i kujawskich 1564-1565 (The Inspection of the Provinces of Great Poland and Cuiavia1564-1565)*, part 1, ed. A. Tomczak, Cz. Ohryzko-Włodarska, J. Włodarczyk, Bydgoszcz 1961, p. 65.

[51] A. Kola, G. Wilke, *Militaria z grodziska...*, pp. 111-114.

[52] K. Wachowski, *Średniowieczna broń...*, p. 196.

[53] A. Kola, G. Wilke, *Zespół grotów...*, pp. 104-105.

The Bombard Balls

During the archaeological works at the castle in Bolesławiec, six complete balls and a fragment of a ball were found. All these balls lay on the paving laid in the fifteenth or at the beginning of the sixteenth century, on the right side of the gatehouse, in a corner between the defensive wall and the castle house. Next to the balls, there was a pile of Renaissance stove tiles[54]. One of the balls was noticed by the inspector describing the castle in 1565, who recorded that on the right side of the entrance to the castle, there stood a large brick house and in front of its door, there was a big stone ball[55]. Thus it seems that its position has not changed much over the last four centuries.

Two of the balls mentioned above are 410 mm in diameter (inv. nos. 1261/75 and 1236/77). The other balls are 310 mm (inv. no. 1237/77), 290 mm (inv. no. 1120/78), 260 mm (inv. no. 1154/78), 152 mm (inv. no. 1192/77) in diameter (Fig. 21). The masses of the largest balls are 108 and 104 kg and the smallest ball weighs 5.05 kg.

Firearms were first used in Europe in the first half of the fourteenth century and the oldest pictorial representations are to be found in some miniatures in the so-called Walter de Milemete hand-written copy, dating back to 1326 and stored in Oxford. A mention from Registro delle Provvisioni of bronze heavy guns manufactured in Florence dates from the same period[56]. In Poland ,the first mention of the use firearms in battle dates back to 1383 and refers to the siege of the castle in Pyzdry in Great Poland. The troops surrounding the castle were said to have used a bronze pixis firing stone balls[57]. A number of mentions

[54] *Zamki środkowopolskie...*, pp. 43, 45-46.

[55] *Lustracja województw...*, p. 65.

[56] Z. Żygulski Jr., *Broń w dawnej Polsce na tle uzbrojenia Europy i Bliskiego Wschodu (Arms in Old Poland against a Background of the Arms and Armour of Europe and the Near East)*, Warszawa 1982, pp. 121-122.

[57] Joannis de Czarnkow, *Chronicon Polonorum*, ed. J. Szlachtowski, [in:] *Monumenta Poloniae Historica*, vol. 2, Lwów 1872, pp. 726-727.

referring to the frequent use of guns of various sizes in Poland dates back to the end of the fourteenth century[58]. One of those mentions appears to be of cardinal importance to our discussion. It says that in the year 1393, the King ordered a bombard to be sent from the city of Cracow to Bolesławiec[59]. Thus, it might be assumed that the stone balls found in Bolesławiec date back to the siege of 1393. According to the mention quoted above, the city of Cracow sent only one bombard. However, as the balls discovered in Bolesławiec varied in size the number of bombards might have been bigger. The earthworks where the guns were placed were situated on the road, 46 m from the closest section of the defensive wall. The balls from these bombards might have destroyed one of the newly-built castle houses, which stood about 70-90 m away from the earthworks and was situated nearly 15 m above it[60].

It must also be remembered that over a dozen balls, which resembled the largest balls from Bolesławiec in size and mass, were discovered in Wielun, lying only about 30 km away from our castle. The bombard from Cracow must have been dragged to Bolesławiec through this town and it might have been there that the gunpowder and balls which were subsequently used in Bolesławiec were prepared[61].

The Balls for Handguns

The two iron balls coming from the 16th and 17th century modern strata seem to be balls for handguns.

The larger ball (inv. no. 1552/72) is 50 mm in diameter (Fig. 22). Before conservation, it weighed 390 g and after conservation, only 360 g. The other ball (inv. no. 1114/77), much smaller and incomplete, was originally 17-21 mm in diameter.

The hand firearm called pixides manuales alias pyschczali (pizschäl) appeared in Europe in the fourteenth century and was in widespread use in the fifteenth century. It consisted of an iron barrel, sometimes with a separate gunpowder chamber, mounted on a long, straight pole. The harquebus, with the barrel mounted on the gun mount, and the harquebus with a hook, a large-bore gun whose barrel, at the bottom, was equipped with a hook for resting the gun

Fig. 22. Ball for a hand firearm (the harquebus with a hook) inv. no. 1552/72 (Photo by K. Karpińska).

on the wall, developed from this weapon in the fifteenth century[62]. The weapon from Loshut in Sweden (first half of the fourteenth century) is considered to be the oldest hand firearm in Europe. The harquebuses with hooks from Lvov and Biecz (15th century) seem to be the oldest specimens on Polish territory[63].

The projectiles used with such handguns were lead or iron balls[64]. Thus, the bigger ball found in Bolesławiec might have been a projectile for the harquebus with a hook and the smaller for the harquebus or pizschäl.

A few small glass balls were also found in Bolesławiec. Cz. Sikorski believed that stone and glass balls could also be used with hand firearms. He could not however prove his point[65]. A stone ball 22 mm in diameter was discovered, together with the above-mentioned coat of plates, in the burnt down timber tower, next to the bolt-heads with which the tower was shot at. The ball seems to have come from a hand firearm[66]. It must be remembered that glass balls are never mentioned in, generally extremely detailed, inventories of Teutonic arsenals, which seems to be an additional argument against the thesis put forward by Cz. Sikorski[67]. This why I will not discuss here the glass balls found in Boles3awiec.

It should be emphasized that the hand firearms stored in Bolesławiec are mentioned in the sixteenth century descriptions of the castle. The oldest mention dates back to 1517. This is an inventory made when Andrzej Dunin of Prawkowice was appointed

[58] M. Głosek, *Broń palna (Firearms)*, [in:] *Uzbrojenie w Polsce...*, pp. 155-156; J. Szymczak, *Organizacja produkcji...*, pp. 286-290.

[59] *Najstarsze księgi i rachunki miasta Krakowa od r. 1300 do 1400 (The Oldest Books and Accounts of the City of Cracow from the Year 1300 to 1400)*, ed. F. Piekosiński, J. Szujski, [in:] *Monumenta medii aevii historica res gestas Poloniae illustrantia*, vol. 4, Kraków 1878, p. 244; J. Szymczak, *op. cit.*, pp. 288-289.

[60] *Zamki środkowopolskie*, p. 39; T. Poklewski-Koziełł, *Średniowieczne zamki...*, pp. 61-62.

[61] T. Poklewski-Koziełł, *Średniowieczne zamki...*, p. 62.

[62] Cz. Sikorski, *Zamek w pałuckiej Wenecji (The Castle in Venice in the District of Paluty)*, Bydgoszcz 1986, pp. 81-86; J. Szymczak, *op. cit.*, p. 292.

[63] M. Głosek, *Broń palna...*, p. 158.

[64] W. Świętosławski, *Koszty broni palnej i jej użycia w państwie krzyżackim w Prusach na początku XV w. (The Cost of Firearms and the Running Costs in the Teutonic State in Prussia at the Beginning of the 15th Century)*, „Studia i Materiały do Historii Wojskowości", vol. 35, 1993, p. 25.

[65] Cz. Sikorski, *op. cit.*, pp. 85-86.

[66] R. Grygiel, T. Jurek, *op. cit.*, p. 91, Fig. 114.

[67] W. Świętosławski, *op. cit.*, pp. 25-26.

to the office of starosta at the castle in Bolesławiec. The document lists 9 harquebuses and 28 harquebuses with hooks stored in the gatehouse or the gate tower[68]. The notes made by the above-mentioned inspector who visited the fortress in 1565 also provide information about the stocks of arms found at the castle. In the gatehouse, there were 7 large harquebuses with hooks, 5 hand demiharquebuses with hooks, and 9 iron pizschälen mounted on poles. There was also an old, broken-down iron heavy gun. Besides these weapons, in the chamber under the gate, there were 47 small stone balls and a barrel of coal used for making the gunpowder[69]. These stocks seem to prove that the castle was prepared for defence as late as in the later part of the sixteenth century, though the state (the broken-down gun) and archaic character (the pizschälen) of the arms seem to suggest that the possibility of such defence was purely theoretical.

The Objects Connected with the Horse and the Rider

The Snaffle Bits

In Bolesławiec, fragments of two bipartite snaffle bits were found. These were a damaged link – inv. no. 1234/72 (Fig. 23a) and a damaged link with a ring – inv. no. 1197/72 (Fig. 23b). Both the snaffle bits date back to the period between the fifteenth and seventeenth century. The link of one of the snaffle bits, circular in cross-section, is 89 mm long. The link of the other, which is square in cross-section, is 78 mm in length and its ring is 51 mm in diameter.

Similar snaffle bits have been in use and have not changed much since the middle ages[70]. This is why the relics from Bolesławiec cannot be dated precisely.

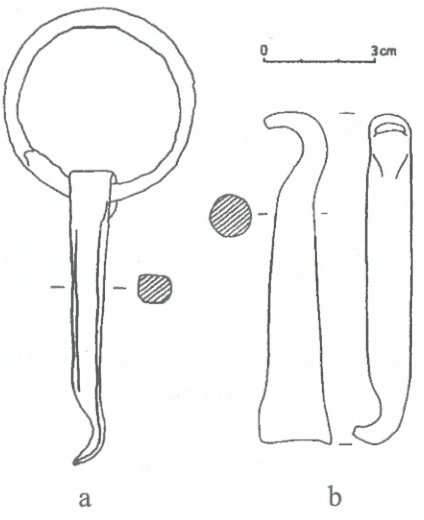


Fig. 23. Snaffle bits: a. inv. no. 1197/72, b. inv. no. 1234/72 (Illustrated by E. Wtorkiewicz-Marosik).

The Curb Bit

A fragment of a curb bit of the Italian type was discovered in a seventeenth century passage leading to the cellar of the castle house. It consisted of a damaged cheek, i.e. an S-shaped side part, and a mouth connecting the two cheeks (Fig. 24).

No medieval curb bits have been found on Polish territory[71]. They were, however, in widespread use and served as part of battle horse-furniture in modern times[72]. Therefore it might be assumed that the dating of the curb bit from Bolesławiec is correct.

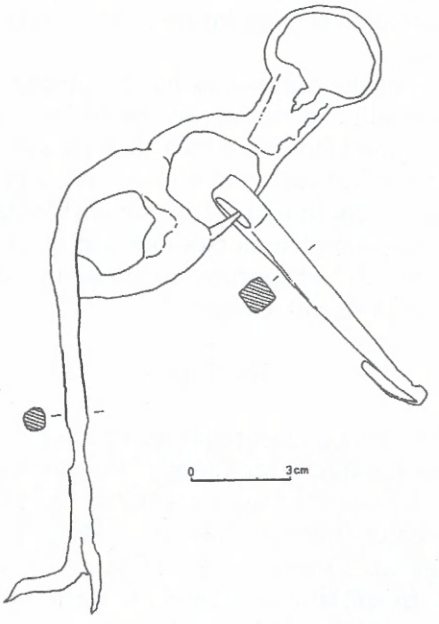


Fig. 24. Curb bit inv. no. 1146/72 (Illustrated by E. Wtorkiewicz-Marosik).

[68] Archiwum Główne Akt Dawnych w Warszawie, Archiwum Skarbu Koronnego, Oddział XLVI, fol. 140 (The Main Old Records Archive in Warsaw, The Crown Treasure Archive, Department XLVI, Card 140.

[69] *Lustracja województw...*, p. 65.

[70] K. Wachowski, *Militaria z grodu na Ostrówku w Opolu (Military Accessories from the Stronghold on Ostrówek in Opole)* [in:] *Studia nad kulturą wczesnośredniowiecznego Opola. Militaria - wyroby bursztynowe (Studies in the Culture of Early Medieval Opole. Military Accessories - the Amber Artefacts)*, Wrocław-Warsaw-Cracow-Gdańsk-Łódź 1984, pp. 67-69; J. Kamińska, *op. cit.*, table III, 19; R. Grygiel, T. Jurek, *op. cit.*, p. 91, Fig. 114: 1, 2; A. Nowakowski, *Militaria z grodziska w Plemiętach. Elementy rzędu końskiego i oporządzenia jeździeckiego (Military Accessories from the Motte in Plemięta. The Elements of Horse-Furniture and Riding Equipment)* [in:] *Plemięta. Średniowieczny gródek...*, pp. 129-132; Z. Wawrzonowska, *Rząd koński i oporządzenie jeździeckie (Horse-Furniture and Riding Equipment)* [in:] *Uzbrojenie w Polsce...*, pp. 181-182; Z. Żygulski Jr., *op. cit.*, pp. 85-86, 284.

[71] Z. Wawrzonowska, *op. cit.*, p. 182.

[72] Z. Żygulski Jr., *op. cit.*, p. 113, Fig. 54, p. 285.

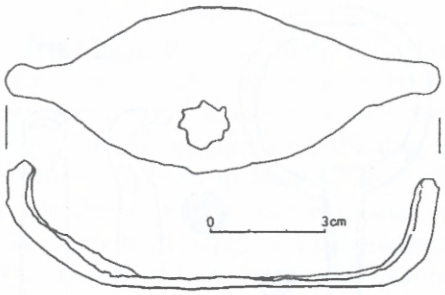


Fig. 25. Stirrup inv. no. 1557/72 (Illustrated by E. Wtorkiewicz-Marosik).

The Stirrup

The stirrup found in Bolesławiec is incomplete (the only surviving part is the foot-rest) and therefore cannot be classified as any type (Fig. 25).

The stirrup was discovered in the seventeenth century passage mentioned above.

The Horseshoes

Two complete horseshoes (inv. nos. 1110/72 – Fig. 26a and 117/73 – Fig. 26b) as well as six fragments (inv. nos. 1076/72, 1144/72, 1050/73, 1181/75, and 1213/76) were discovered at the castle in Bolesławiec and three horseshoes (inv. nos. 14/79, 28/79 and 105/79) and three fragments were found on the road leading to the castle.

Only two of the fragments (inv. nos. 1181/75 and 1213/76) come from the fourteenth century strata and the other relics from the fifteenth, sixteenth and seventeenth century layers and the layers of turf and humus.

One of the horseshoes has 8 openings for the horseshoe nails and groove (inv. no. 14/79 – Fig. 26c). The other horseshoes in which such gaps are visible have 6 openings each and do not have a groove. It seems that according to J. Kaźmierczyk's classification, all the complete horseshoes can be classed as type VI, which had appeared in Silesia in the second half of the thirteenth century[73].

The Spurs

Nine complete and incomplete prick-spurs with star-shaped points were found at the castle in Bolesławiec. One of the fragments comes from the fourteenth century stratum (inv. no. 1151/77), another fragment was discovered in the fifteenth or sixteenth century stratum (inv. no. 1569/72), and the other spurs were unearthed in the layers dated to the period from

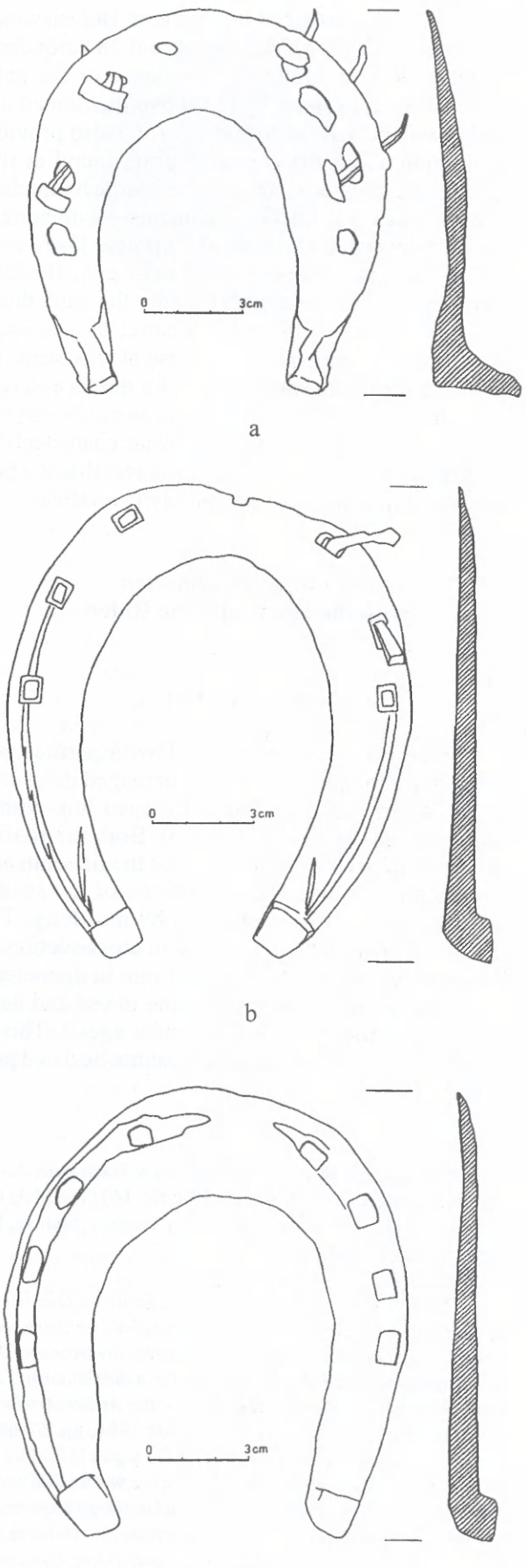


Fig. 26. Horseshoes: inv. no. 1117/73, b. 1110/72, c. 14/79 (Illustrated by E. Wtorkiewicz-Marosik).

[73] J. Kaźmierczyk, *Podkowy na Śląsku w X-XIV w. Studia z dziejów kultury materialnej (Horseshoes in Silesia in the 10th-14th Centuries. Studies in the History of Material Culture)*, Wrocław-Warsaw-Cracow-Gdańsk 1978, pp. 86-103.

the fifteenth to seventeenth century (one of the spurs was discovered in the rubbish damp in front of the gatehouse, near the castle kitchen, in the layers dating from the second half of the seventeenth century (inv. no. 1973/78).

No comprehensive studies of late medieval and modern spurs have yet been carried out. Only the spurs found in Little Poland have been systematically described by S. Kołodziejski[74]. A part of a chapter on horse-furniture and riding equipment dealing with spurs can be found in the book entitled *Uzbrojenie w Polsce oredniowiecznej 1350-1450 (Arms and Armour in Medieval Poland 1350-1450)*[75].

Two of the spurs (inv. no. 1104/72) were found together and as they are almost identical they can be considered a pair. Viewed from above, their arms are shaped like parabolas and view from a side, they are curving. The terminals are round. The spurs differ from each other in the shape of the stars. One of the spurs has a six-pointed star and the other an eight-pointed star. Both the stars are 125 mm in overall length, the spurs have a maximum arms span of 67 and 102 mm, both the points are 32 mm long, the six-pointed star is 27 mm in diameter and the eight-pointed star 24 mm in diameter (Fig. 27-28).

According to S. Kołodziejski's typology, such spurs correspond to spurs of type D, which were in use in Little Poland in the second half of the thirteenth and the first half of the fourteenth century[76]. The specimens described here might have been used for a very long time or the dating of Type D is much broader. This issue requires further studies.

Another complete spur is find inv. no. 1071/72. Viewed from above, the arms are shaped like a parabola and viewed from a side, they are quite straight (only its two round terminals are slightly turned over). At the terminals, there are special loops for the leather straps fastening the spur to the boot. The spur has an eight-pointed star. It is 170 mm in overall length, the spur has a maximum arms span of 88 mm, the point is 68 mm long, and the star is 36 mm in diameter (Fig. 29).

Incomplete spur inv. no. 1140/78 is almost identical. It has twin arms and a twin point neck, but neither the star nor the terminals have survived. The length of the spur without a star is 137 mm. Thus, the spur with a star would be up to about 160 mm long. The spur has a maximum arms span of 62 mm. The star must have been about 50 mm in diameter.

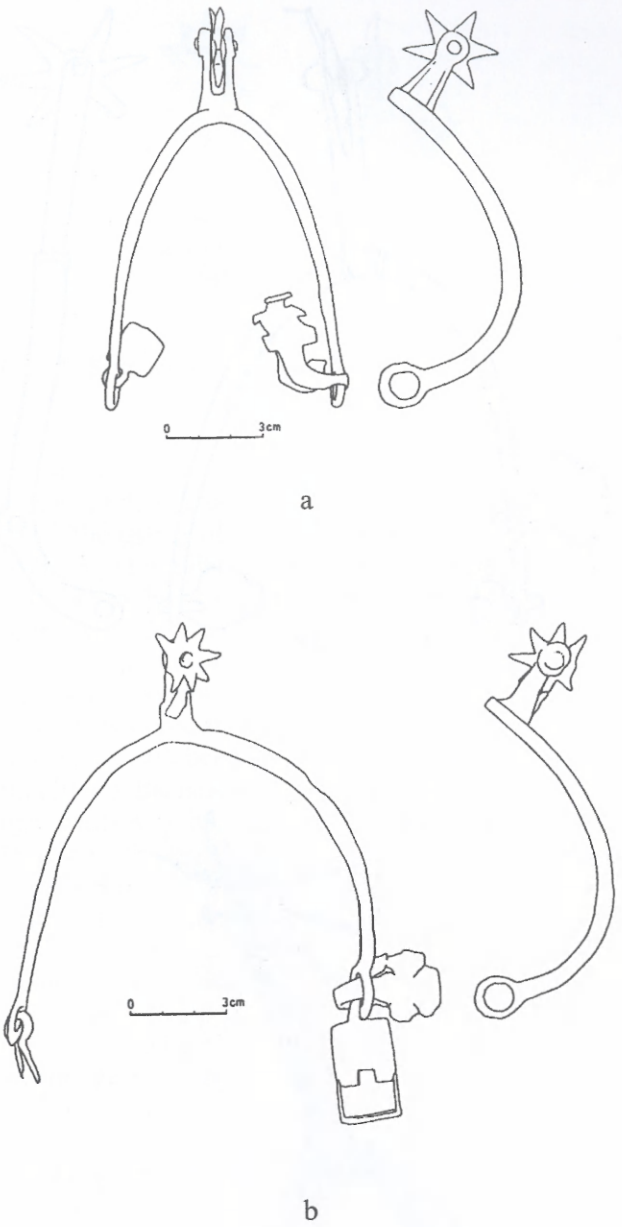


Fig. 27. Pair of spurs inv. no. 1104/72 (Illustrated by E. Wtorkiewicz-Marosik).

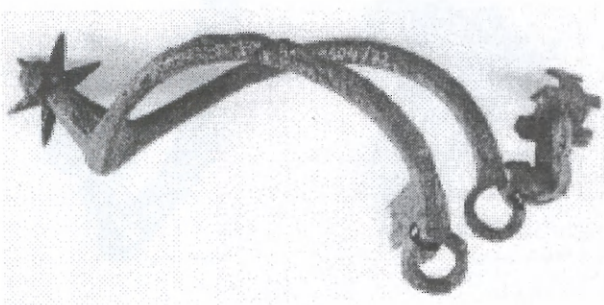
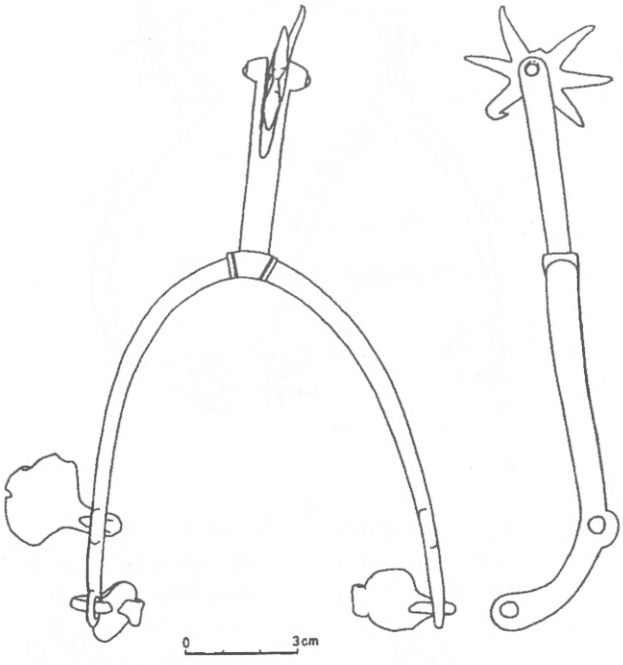


Fig. 28. Spur inv. no. 1104/72 (Photo by K. Karpińska).

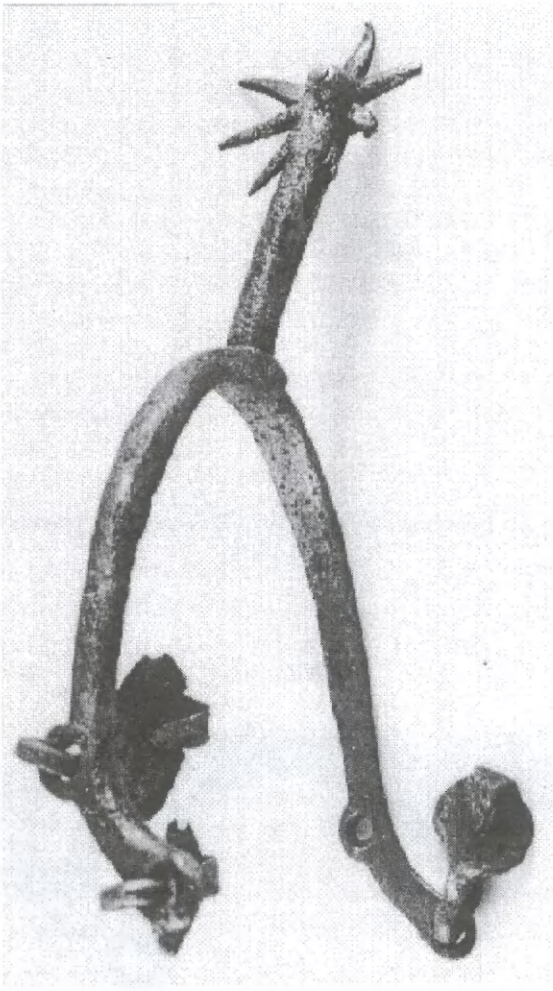
[74] S. K o ł o d z i e j s k i, *Les éperons a molette du territoire de la Petite Pologne au Moyen Âge*, [in:] *Mémoires Archéologiques*, ed. A. K o k o w s k i, Lublin 1985, pp. 161-179. Early medieval spurs have been described by Z. H i l c z e r ó w n a [*Ostrogi polskie z X-XIII w. (Polish Spurs of the 10th-13th Centuries)*, Poznań 1956]. Also see: K. W a c h o w s k i, *Militaria z grodu...*, pp. 30-61.

[75] Z. W a w r z o n o w s k a, *op. cit.*, pp. 189-191.

[76] S. K o ł o d z i e j s k i, *op. cit.*, pp. 166-167, 170, table 1, Fig. 5.2.



a



b

Fig. 29. Spur inv. no. 1071/72 (Illustrated by E. Wtorkiewicz-Marosik, photo by K. Karpińska).

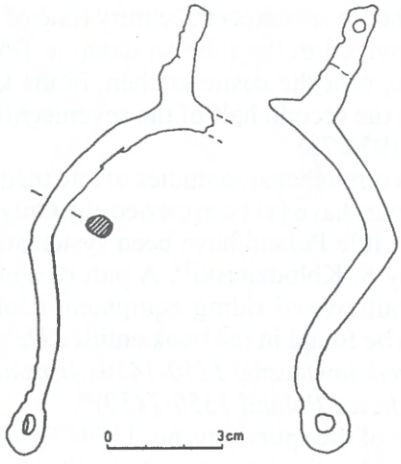


Fig. 30. Spur inv. no. 1103/78 (Illustrated by E. Wtorkiewicz-Marosik).

An analogue of both the spurs was discovered at the castle in Torun. This spur (inv. no. MT/ZK701) was dated at the later part of the fifteenth century[77]. All three spurs had long points and straight arms, which seems characteristic of fifteenth century relics. Thus, spurs inv. nos. 1071/72 and 1140/78 can be plausibly dated at the fifteenth century[78].

Although only a fragment of spur inv. no. 1103/78 was found, its shape and size can be reconstructed. Viewed from above, the arms are shaped like a letter U, and viewed from a side, they are bent at an angle of ninety degrees. The spur is equipped with a heel. The star is missing. The find has a round, turned over terminal. The relic is 118 mm long (the length of the spur with a star would be about 135 mm). The spur has a maximum arms span of 84 mm and the star would be about 30 mm in diameter (Fig. 30).

According to S. Kołodziejski's typology, this find corresponds to type C, which in Little Poland, is dated at the end of the thirteenth and the beginning of the fourteenth century[79]. The spur can be dated as in the case of type D.

Spur inv. no. 1569/72 is incomplete. Only a small fragment of the V-shaped arms with a hooked heel and a fragment of the point neck were found. Therefore the spur cannot be classified as any type. Similarly, the state of preservation of spurs nos. 1312/72 and 1151/77 makes it impossible for the archaeologist to provide any detailed description (Fig. 31).

Finally, spur no. 1073/78 is very untypical. It is a small, nearly complete bronze spur, which was riveted to the boot. The spur is 27 mm in overall length and the star is 22 mm in diameter. I am familiar with

[77] *Broń średniowieczna...*, p. 46, table 39.

[78] Z. Żygulski Jr., *op. cit.*, p. 114; S. Kołodziejski, *op. cit.*, p. 170, Fig. 9.

[79] S. Kołodziejski, *op. cit.*, pp. 166, 168, Fig. 5.1, p. 170, table 1.

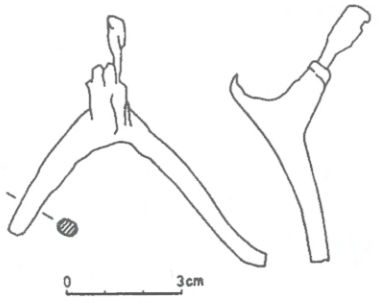


Fig. 31. Spur inv. no. 1569/72 (Illustrated by E. Wtorkiewicz-Marosik).

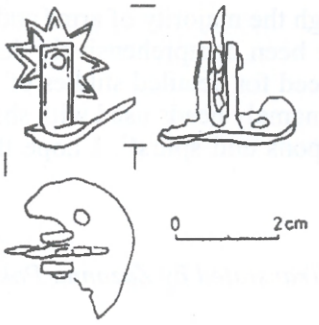


Fig. 32. Spur inv. no. 1073/78 (Illustrated by E. Wtorkiewicz-Marosik).

no analogues of this relic, but the fact that it was found in an undisturbed rubbish damp layer allows the archaeologist to date it to the second half of the seventeenth century[80].

Conclusion

The military accessories found at the castle in Bolesławiec on the Prosna constitute a very heterogeneous set of finds. It differs from the sets of military accessories from Siedlątków, Słoszewy, Nowe Miasto-upon-Warta and Plemięta. It must be remembered that the relics from Siedl l tków came from a smithy, where their owners had left them to have them repaired, the objects from Słoszewy were found in a workshop where bolt-heads were made, and the finds from Nowe Miasto-upon-Warta and Plemięta were discovered at burnt-down strongholds and were used by the inhabitants. Consequently, all these sets were created deliberately, while the set from Bolesławiec consists of objects of various provenance. Only some of the finds discovered on this site were property of the castle's inhabitants. The stone balls and some of the heads for projectile weapons were shot into the area contained within the defensive wall at the siege. The last group of accessories comprises the fragments and damaged objects which were lost or thrown away as useless. The armour plates and sword pommel can be mentioned here.

I do not know, however, whether the pair of spurs of type D (inv. no. 1104/72) can be considered as lost objects. Because they were found in the sixteenth century courtyard layer they may have been thrown away as obsolete and out of fashion. The fact that they were found together seems to suggest that the spurs were in use and subsequently given to a child, who threw the old toy away. When we compare them with the spurs found in Little Poland, we may assume that they were probably made in the fourteenth century. So they were in use for about 200 years. This span of time seems to be very long, but arms and armour historians gradually come to the conclusion that in the Middle Ages weapons were used as long as they remained useful[81].

The dating of many of the accessories coming from the strata dating back to the period from the fifteenth to the beginning of the seventeenth century found in Bolesławiec is imprecise. That is the case with many of the projectile weapons heads. The mention in the sixteenth century inspection records of the bolt-heads stored at the castle suggests that crossbows might have still been used, at least for hunting, at that time. Thus, the heads discovered in the sixteenth century strata may be remnants of contemporary arms. However, the possibility that some of them, which were lost or thrown away in the fourteenth or fifteenth century, were moved from the older to the younger layers during some earth works carried out at the castle cannot be excluded, either.

The above-mentioned great diversity of the set of military accessories from Bolesławiec is also its advantage, because it may be a contribution to the knowledge about various kinds of arms and the history of military science. For example: if one makes a connection between the stone balls and remnants of the earthworks, the destroyed house and the information about the purchase of a bombard which was to be used in the king's war with Duke Władysław Opolczyk, one can easily imagine what the siege of the castle during this war may have looked like.

Moreover, the iron balls for handguns and sixteenth century mentions of some firearms stored at the castle provide information about the state of the crew's arms and armour, which were obsolete and archaic, especially in the later part of the sixteenth century.

During the examination of military accessories from Bolesławiec, I came to the conclusion

[80] *Zamki środkowopolskie...*, p. 60.

[81] M. G ł o s e k , *Militaria z grodziska w Plemiętach. Broń sieczna, drzewcowa i obuchowa (Military Accessories from the Motte in Plemięta. The Side-, Pole and Butt Arms)*, [in:] *Plemięta. Średniowieczny gródek...*, pp. 99-101; A. N o w a k o w s k i, his voice in the discussion at the conference „Broń i oporządzenie na terenie Barbaricum w pradziejach i średniowieczu" (Arms and Military Accessories in Barbaricum in Primeval Times and the Middle Ages), which was held at Łódź University from 14th to 15th November, 1997.

that although the majority of arms and armour categories have been comprehensively described, there is a great need for detailed studies of three military categories, namely heads used with shafted and projectile weapons and spurs[82]. I hope they are ready soon.

Translated by Zuzanna Poklewska-Parra

[82] The fact that in a fundamental monograph on Polish Arms and Armour in the late Middle Ages, different types of bolt-heads are illustrated by heads from Słoszewy, which are untypical of Poland in the late Middle Ages, because they are equipped with a tang, seems to suggest that there is a great need for such studies [A. Nadolski, M. Lewandowski, *Broń strzelcza (Projectile Weapons)*, [in:] *Uzbrojenie w Polsce...*, Fig. 50.