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THE CHANGES OF OFFENSIVE ARMAMENT OF THE POLISH MERCENARY INFANTRY IN THE FIRST PART OF THE 16TH CENTURY AND THEIR INFLUENCE ON THE TACTICS OF THE UNIT

When asked whether weapon brings peace one cannot answer correctly without the basic knowledge of armament. In accordance with the saying *si vis pacem para bellum* a war became one of the means of introducing or rather imposing peace. Although to conduct a war one needs three things, i.e. money, money and money, it cannot be denied that in a direct conflict the most important appear to be pikes, halberds, spears, swords, cutlasses or, last but not least, black powder weapons. The latter started to dominate in modern battlefields. Depending on regional or characteristic features of fighting armies or the military customs, artillery or hand-held firearms were used, mostly the combination of individual and group firearms in suitable proportions.

I would like to draw attention of the reader to some elements connected with offensive armament of the Polish mercenary infantry during the reign of Alexander and Sigismund I of Poland. Some changes introduced into that field within the first half of the 16th century suggest modification of not only the fittings of particular weapon categories but also tactics of using the weapons in the battlefield.

By the end of the 15th century firearms were widely used in their simplest form by the Polish mercenary infantry which was famous for being mainly equipped with missile weapons. Firearms quickly forced out crossbows. During the first half of the 16th century the changes consolidated and the shooters started to use more often firearms which were more complex than handgonnes. The example of the latest types of firearms were arquebuses. They were analysed in a different place as representatives of firearms (Bołdyrew 2010, pp. 525–536). A few aspects of their functioning are worth quoting in this article.

The barrels of arquebuses had thicker walls as they were loaded with a double dose of gunpowder which allowed the bullet to leave the barrel faster and it flew to a longer distance. At the same time it caused more damage to the weapon. Therefore a different cross-section of the barrel was used. In contrast to the simplest types of firearms of the 15th and the 16th centuries, arquebuses were fired not with a slow match in the hand of a shooter or a matchlock, but with a wheellock. It was created out of about 40 elements and contained numerous parts requiring precise tooling, such as a small link chain, springs etc. Another important element was a gun butt which was shaped so as to allow for shooting from the arm and not from below it. Taking the aim was facilitated by placing the cheek on a specially shaped surface of the gun. In spite of numerous problems with sub-assemblies both at the stage of production and use (maintenance) the wheellocks were quite reliable and guaranteed a precise shot which made up for all the costs of purchase of the gun. Because of its complicated construction the price of it was higher than the price of a typical handgonne (Bołdyrew 2010, p. 526).

According to the sources, the first arquebuses appeared in Poland in 1539 (Wimmer 1987, p. 91). The date has recently been changed into 1538 (Plewczyński 2001, pp. 188–119). In fact it happened three years earlier, i.e., in 1535. *Jezik s Bolislava* who appeared *cum archibusz* (AGAD, sign. 26, k. 118) had one item of this weapon. It is a unique situation that year but within the next two years arquebuses appeared in larger numbers. In 1536 two

of them were already present in two detachments: in Lambert Gnoyeński's detachment there were three arquebuses (AGAD, sign. 27, k. 79–81) and in Jan Strzechowski's detachment – eighteen arquebuses (AGAD, sign. 27, k. 27–30v). We do not have the registers of infantry from 1537 but in 1538 there were arquebuses in 42 detachments so one can say that they were regularly used.

According to the preserved registers of the Polish mercenary infantry there were 8000 shooters, who constituted more than 70% of all the combatants. This only confirms the dominating role of firearms in this type of troops. There were 644 soldiers with arquebuses, which was 7.8 % of all the shooters and 5.5 % of all the soldiers. Although there were not many of them, numerous changes were evoked by their presence.

Another issue is the introduction of spears (pikes) for some of the shooters (Wimmer 1987, p. 104). Useless for distance fighting, they were indispensable for direct encounter. It was proved by the Polish mercenary infantry in the battle of Obertyn in 1531 when the troops attacked the Moldavian army during the sally through the south-eastern gate of Jan Tarnowski's camp (Spieralski 1962, pp. 171–187; Wimmer 1987, p. 107; Plewczyński 1994, pp. 175, 184–185, 212). Other changes in pole weapons used by the infantry spearmen are worth noticing. Contrary to their name, the spearmen did not use spears (pikes) but they preferred to use javelins and halberds which were quite frequently used. As T. Grabarczyk proved, "there is no data that the Polish mercenary infantry in the 15th century used pole weapons with complex heads" (Grabarczyk 2000, p. 127).

There are four kinds of pole weapons in the registers preserved for 1522–1547. These are javelins, pikes (spears), halberds and banners. There was a huge number of them. Apart from them, there were also lances which appeared in the detachment of Stanisław Ożarowski in 1531 (AGAD, sign. 19, k. 224v; Spieralski 1962, p. 261), and of Mikołaj Iskrzycki in 1532 (AGAD, sign. 20, part I, k.16; AGAD, sign. 22, k. 154) and 1538 (AGAD, sign. 32, k. 169v). In Stanisław Ożarowski's unit in 1531 there also appeared one glaive (AGAD, sign. 19, k. 225; Spieralski 1962, p. 263).

Table 1. Pole weapons of the Polish mercenary infantry, 1522–1547

Type	Number	Percentage of pole weapons	Percentage of infantrymen with pole weapons
"Wood" (perhaps sort of long spears)	2122	66.25	17.69
Javelins	626	19.54	5.22
Banners	279	8.71	2.33
Halberds	171	5.34	1.43
Lances	4	0.12	0.03
Glaives	1	0.03	0.01
Together:	3203	100	26.71

Taking into consideration the fact that at that time there were 11993 soldiers in the infantry (regular employment 15040) it means that 26.71% of combatants had pole weapons. It was used more widely than it has been assumed. Contrary to the view that only spearmen were using this weapon, there were 1546 spearmen, i.e., twice as few as the number of pole weapons.

The most numerous group (2122), were long spears or pikes. This sort of weapon had a small (about 5–10 centimetres) head with a socket. The head was polygonal in cross-section. The socket was provided with langets running along the spear shaft. It not only strengthened the whole construction but also did not allow to chop off the head from the shaft. The shaft itself was as long as 5 metres (Nowakowski 1994b, p. 210). It is worth noticing that the shaft having 3–4 metres was easier to use and was less prone to breaking. At the beginning of the 16th century a shorter type of spear appeared, a so-called Landsknecht pike. Basic fencing could be conducted with this weapon (Żygulski 1982, p. 159).

Blacksmiths were responsible for production of spearheads, analogously to other types of weapons. They placed the heads on shafts supplied by carpenters and joiners. An average cost of a pike (spear) is difficult to estimate. We know that it was between 2 and 22 groschen for a typical weapon and about 65 groschen for a special one. Good ones could cost even 100 groschen (Bołdyrew 2005, p. 266, table 50). Pikes were used both by spearmen and common soldiers – shooters. For spearmen the pike was a basic offensive weapon and for shooters an accompanying one. They used it after shooting their arquebuses or in direct encounter being a result of infantry attack (e.g., the battle of Obertyn). It does not mean that the spearmen were using spears only. Out of 1546 spearmen, only 749 used spears and 797 used halberds and javelins.

Another issue is regularity of appearance of this weapon in the subsequent years. It is depicted in the graph *Regularity of using pikes in the Polish mercenary infantry in 1522–1547*. It shows that the greatest percentage of pikes was used in 1530, 1531 and 1538 (37.97%, 27.16% and 32.43% respectively). The

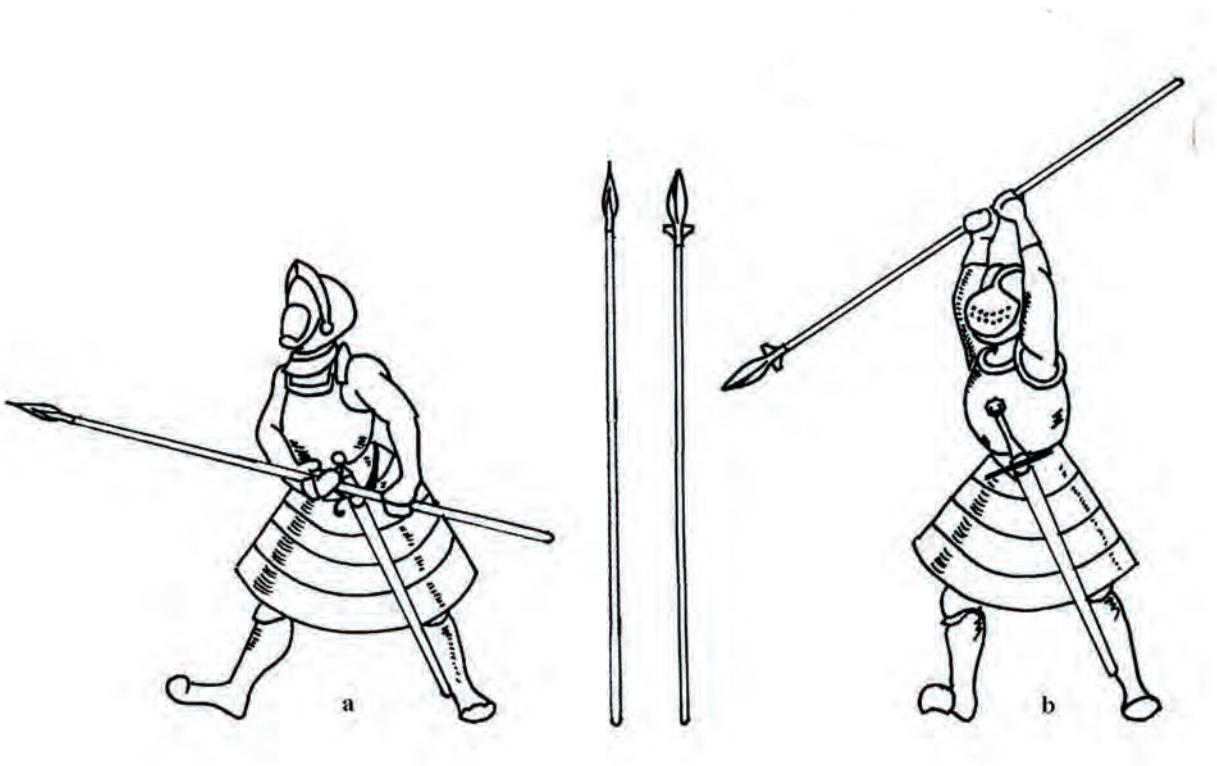

Fig. 1. Lance and javelin (according to the painting: *The Battle of Orsza*)

last two years were marked with Jan Tarnowski's campaigns with Moldavia. This weapon was used with success at that time, especially in 1531. It was depicted in this way in a woodcut in the edition of *Kronika…* by Marcin Bielski from 1564 (Spieralski 1965, fig. on p. 339). One can observe there a camp of the Polish army with groups of infantrymen holding pole weapons. Other years which can be analysed based on the preserved sources show that there were not that many pikes in use, usually less than 1% to 5.5%. The exception are 1522 and 1528 where there was a greater number of pikes. One can therefore assume that in case of a huge campaign the soldiers (especially the shooters) bought additional weapons, thus improving the tactic possibilities of infantry units.

Apart from pikes, the soldiers of the mercenary infantry used javelins. There were 626 of them at that time. About 20% of soldiers carrying pole weapons owned javelins. These soldiers comprised about 5% of all identified owners. We do not know much about the javelins used by the Polish warriors in the 14th and the 15th centuries. These weapons are described in older sources as hunting weapons (Nowakowski 1994b, pp. 208–209). Javelins had shorter shafts than lances or spears. Their heads were also smaller. It has been assumed so far that they were used for throwing at a distance. As less efficient than arrows, crossbows or firearms, javelins were believed to have been forced out by the mentioned weapons from the open battlefield (Głosek 1998, p. 43). However, as it is evident in the registers, they appeared quite frequently in the battlefield. If one accepts that the weapon for fighting had common elements with the weapon for hunting, it must be emphasised that this kind of weapon can be seen in the painting entitled *The Battle of Orsza* in the scene depicting an infantry unit. One of the spearmen standing in front of the pavisiers holds it above his head. It has got all important elements allowing for its identification as a javelin (Żygulski 1981, figs. 25–26; Bołdyrew 2005, fig. 35b).

The javelins were used regularly. They appeared in the mercenary infantry except for 1522 and 1538, which is depicted in the graph *Regularity of using javelins in the Polish mercenary infantry in 1522–1547.* Interestingly, there was no javelin in the 43 units mobilised for the Moldavian campaign of 1538 (except for Mikołaj Iskrzycki's detachment where there were 30 of them). In that campaign the pike was the most frequent staff weapon, probably as a result of the Hetman's order. In this campaign he only used infantrymen with long pikes, just like seven years earlier in the Battle of Obertyn. The analysis clearly shows that the javelins did not have the dominant position but they were still present in

the army. There were about 4.24 – 11.17% of them. M. Głosek claimed that "[…] javelins were used to defend fortresses" (Głosek 1998, p. 43). It is important to emphasise that the data concerning 1547 come from one register of a small detachment. It was Maciej Włodek's unit constituting the garrison of Kamieniec Podolski (AGAD, sign. 51, k. 53–54). There were 19.15% of javelins and it was the greatest number of these weapons at that time. In case of a siege javelins were useful for fighting on the walls of the castle.

The last type of pole weapons with simple heads used by the Polish mercenary infantry was the lance. It is mentioned only four times in the sources, which means that it must have been rare. There is no doubt concerning its appearance and genesis at the beginning of the 15th century (Głosek 1998, p. 41). The situation became complicated by the end of the 15th century. We know that the lance was used by infantrymen, but it was shorter than the spear (Głosek 1998, p. 42; Grabarczyk 2000, pp. 126–127). The javelin could not be meant under the term "lance" in registers from the first half of the 15th century, as the name was widely used and it was never used interchangeably. It was neither a pike nor a spear for an infantryman. Since there is no term for "a spear," one may assume that the lance was the spear or it was its shorter version. A kind of solution can be again provided by the painting entitled *The Battle of Orsza*. Next to the spearman with a javelin there is his comrade carrying a pole weapon with a simple head (Fig. 1). We can imagine not only the construction of the head itself but also the length of the shaft (Żygulski 1981, fig. 25; Bołdyrew 2005, fig. 35a). The comparison of those two combatants and both sorts of weapon allows to draw the conclusion that they were more or less of the same size, and a bit longer than the height of the warriors (see Fig.1). In other words, if one of the spearmen holds a javelin, another one (because of the composition in the painting) holds a spear in his hands. Since a spear was not described in any register I assume that it could be a lance.

Among the described types of pole weapons used by the Polish mercenary infantry between 1522 and 1547 there are halberds, which were not recorded in the 15th century (Nowakowski 1994b, pp. 210–211; Głosek 1998, pp. 44–45; Grabarczyk 2000, p. 127). However, they appeared in the registers 171 times. The combatants fighting with halberds comprised 5.34% of all the soldiers with pole weapons, but only 1.43% of the total number of infantry. The halberd was depicted in numerous iconographic sources by the end of the 15th century. "The items being a part of a bigger collection come from the area which was not part of Poland in the second half of the 15th century" (Głosek 1998, pp. 44–45). It is therefore difficult to imagine details of such weapons. Its shafts were definitely longer than the size of a man. This weapon had a head with a blade resembling an axe. It was shaped like a hook and ended with a spike. Sometimes, analogously to pikes or lances, it was provided with langets (Nowakowski 1994b, p. 211; Głosek 1998, pp. 44–45; Bołdyrew 2005, fig. 13f-h). Halberds were not significant part of the armament but they appeared (except for the registers from 1522 and 1542) regularly. There were about 0.26% to 14.58% of them (out of the total percentage of soldiers having pole weapons). The highest percentage of them appears in the registers of 1528 but two years later (in 1530) there was a half of them (7.63%). It is well depicted in the graph *Regularity of using halberds in the Polish mercenary infantry in 1522–1547*. Maciej Włodek's detachment had more of them in Kamieniec Podolski in 1547. Halberds and javelins were necessary to fight off the enemy.

Another sort of pole weapons with complex heads was the glaive which was mentioned only once. In the 15th century the term meant a knightly spear because a glaive was a synonym of a "lance" (Nowakowski 1994b, p. 209). It is however difficult to believe that an average infantryman used a spear with a long and heavy shaft – a weapon related to heavy cavalry. What is more, the meaning of the word "glaive" changes. While the word "lance" appeared in registers many times, "glaive," as I already mentioned, appeared only once. Therefore, I assume that the author of the register thought that this kind of weapon was so rare that it was worth noticing and mentioning. It is also confirmed by the presence of numerous halberds belonging to the same group of pole weapons as the glaive. The glaive is said to have a quite long and wide head with one sharp edge. It would resemble a wide scythe mounted on the shaft in the upright position. The shaft must have been of similar length as the shaft of the halberd (Bołdyrew 2005, fig. 13b). Among all the mentioned halberds only one was referred to in more detail. In Jan Starzechowski's unit in 1538 there was a mention at the name of one of the spearmen, *Mathis Koczebuskij*: *halabart ma mijecz ijnnij* (AGAD, sign. 32, k. 29v). It is the only information given by the soldier on poor condition of the weapon which was supposed to be replaced with another one.

In Table 1 (in contradiction to a general weapon classification) banners were mentioned. They are not pole weapons per se, but they have their origin there.

An average spear with a piece of cloth might have become a sign of order or a signal for soldiers. The decoration of the banner was of course important. As T. Grabarczyk wrote: "it is not difficult to imagine that it could also be used as a typical pole weapon" (Grabarczyk 2000, p. 186; Nowakowski 1994a, p. 271). These were present in each of the units for practical reasons. As we know, all the orders were passed to the soldiers with the use of sound signals or arranged and earlier agreed movements of banners. There were 279 of them in the mercenary infantry. Among the soldiers carrying pole weapons those carrying the banners comprised 8.71%, and 2.33% as related to the total number of combatants in the registers. It means that there was one man carrying a banner for 43 soldiers. This calculation resembles a division suggested by J. Wimmer who assumed that the infantry units had been divided into groups of 40 people for one banner (Bołdyrew 2005, illustration 13b).

The graph *Regularity of using banners in the Polish mercenary infantry in 1522–1547* describes this phenomenon, taking into consideration the subsequent years of the first half of the 16th century for which registers exist. As it can be seen, it was only 1534 that was exceptional as there were more than 3% of banners. The usual percentage was 2.5% per unit. Neither 1531 nor 1538, the years of enlistment of huge armies, were exceptional in this case.

The description would not be complete if we only limited it to changes of some of the elements of mercenary armament. Those with other categories of weapons created the right sets of equipment, that is types of armament. One has to pay attention to the appearance of arquebuses in the equipment of some shooters. Although not very numerous, they were able to change the fighting abilities of the infantry units. Another significant issue was the appearance in 1520–1540s of spearmen with more complex weapons than just pikes. Equipment in spears (offensive weapons) consisted by half of pikes and by half of javelins and halberds. There was also a group of shooters equipped with pole weapons. There were 1373 of them, which is 16.33% of all shooters and 11.54% of all soldiers. The presence of the soldiers with pole weapons is depicted in *Shooters with pole weapons as compared to the rest of soldiers in 1522–1547*. It clearly shows that the greatest number of them appeared in 1528, 1530, 1531 and 1538. The presence of the shooters who could transform into spearmen is obvious for 1531 and 1538. It is, however, difficult to connect their presence in 1528 and 1530 with a particular political or military event in the history of the Kingdom of Poland. In other years they appeared so rarely that their presence can be considered incidental.

An armed soldier, equipped in accordance to a particular pattern and standing in the right place could act tactically. Some elements of mercenary armament (arquebuses and pole weapons) influenced to a huge extent the shape of equipment, which, on the other hand, made its impact on possibilities of using the infantry in the battlefield.

Some changes appeared with the introduction of arquebuses in the 1530s as it also meant the change in fighting abilities of infantry units. As we know, the usage of a new weapon does not decide about gaining the superiority. What one also needs is the right method of using technically advanced equipment. Analysing the registers, it is possible to notice a particular regularity. There was usually one arquebus for ten people and the arquebusier usually stood as the first shooter, after the spearman and the pavisier. Such an arrangement was introduced for the first time in Jan Starzechowski's unit from 1536 (AGAD, sign. 27, k. 27–30v). In 1538 only two out of 42 units had too few arquebuses to achieve that arrangement. The rest, that is 40 of them (more than 95%) were arranged in accordance with the described model. During the following years at least half of the army units were arranged in the same way before a battle. The best proof of intentional activity in this case are the sources. It is stated that a hackbut is behind an arquebus, and Wojciech Głuchowski who was holding it was the third soldier in a column of ten, just after a spearman Jakub Dobrzucki and a pavisier Jan Wartmicki. This concerned Krzysztof Wilkowski's detachment in (AGAD, sign. 32, k. 49v). A similar situation occurred twice in Florian Zebrzydowski's unit in the same year. Some of the arquebusiers had armour (AGAD, sign. 32, k. 15v–18v). What was the purpose of this? The units in the battlefield stood in tens, thus creating columns with the soldiers standing one after another. This way, all the spearmen formed the first row and all the pavisiers formed the second row, etc. In distance fighting all the soldiers from the first row kneeled down and the ones in the last row (the shooters) fired. Then the last but one row stood up and fired, etc. When the first row shooters shot (i.e., the third row of the detachment counting from the front row) the salvo of the whole unit was over. Theoretically, the whole procedure might have been started again because the soldiers immediately started to load their guns.

Probably as a result of war experience some shooters with arquebuses were placed at the back

of tens. This kind of arrangement was introduced in Jan Pisarski's unit in 1542 (AGAD, sign. 42, k. 247–249). There must have been some reasons in the 1530s for the fact that rittmeisters and commanders decided to strengthen the beginning of the salvo of the whole unit and weaken its ending at the same time. It is understandable, if we take into account the fact that soldiers shooting their arquebuses as the first ones used the range and accuracy of the guns to reach the enemy sooner and from a bigger distance than it would have been possible with hackbuts. It can be treated as a curiosity or experiment that, according to Mikołaj Bliźnicki's register from 1542, the soldiers with arquebuses were arranged in one ten which could only slightly improve the impact of each salvo in each of the rows of the unit (AGAD, sign. 42, k. 257–259). The lack of increase in the number of arquebuses in the mercenary infantry has already been mentioned. If we assume that in 1530 and the 1540s the main aim was to supply the weapons for the infantry only to some extent (there were certainly other aims for the combatants than shooting the enemy), it may be assumed that arquebuses were treated as a special destination weapon. They were to strengthen a salvo, they could be used for eliminating a given target and during the fight they facilitated precise shooting for soldiers who were often hidden behind the sconce fortification or battlement of towns or castles. It also worked when Polish infantry was stationed in a fortified place, as it was the case of Maciej Włodek's detachment (in 1547) in Kamieniec Podolski (Wimmer 1987, p. 98).

As far as the possibilities of the infantry units are concerned, it is important to mention the improvement of defensive abilities by increasing the number of pole weapons. As it was proved above, its number increased during the two campaigns led by hetman Jan Tarnowski against Moldavia. It is possible to discuss the arrangement of infantry units on the example of the Obertyn campaign. It opened new possibilities owing to the changes of the armament and equipment at the same time, which is especially clear based on the example of the 1531 campaign (Spieralski 1962; Plewczyński 1994). Among ten units taking part in the campaign three did not have shooters with pole weapons (Hieronim Noskowski's – AGAD, sign. 19, k. 222–223v; Spieralski 1962, pp. 257–260; Hynek Piotrowski's – AGAD, sign. 19, k. 216–217v; Spieralski 1961, pp. 248–251 and Balcer Rusiecki's – AGAD, sign. 19, k. 226–227; Spieralski 1962, pp. 263–265). Five units had shooters with pole weapons. The men were arranged in such a way that they usually took the last 2–3 places in a ten (AGAD, sign. 19, k. 211v–215, 218–221v, 223–225v, 228–229; Spieralski 1962, pp. 241–247, 251–257, 260–263, 265–267). If we assume that a unit fired a salvo just as described above, the presented arrangement could mean that the last 2–3 rows of soldiers could transform into light pikemen after shooting their arquebuses (what they did at the beginning) and defend the unit in a better way. That was the case in Lambert Gnoyeński's unit. Among 25 described tens, the shooters with pole weapons took the last three places in 8, and the last two in 7 of them. Generally, 15 tens decided whether the tactics and the changes in armament and equipment were successful. The last two units, i.e., Wojciech Polak's from Leśnica (AGAD, sign. 19, k. 209–211; Spieralski 1962, pp. 237–241) and Feliks Ziemicki's (AGAD, sign. 19, k. 215–215v; Spieralski 1962, pp. 247–248) had shooters with pole weapons. However, the shooters in Wojciech Leśnicki's unit took their position just after the pavisiers and in the second unit they were placed at different positions. As far as the defensive abilities are concerned, the importance of changes in armament and equipment has been emphasised. But the campaign of 1531 brought something new with regard to the tactics. As it has already been suggested, the infantry during the battle of Obertyn moved from defence to offensive. As M. Plewczyński wrote: "in spite of numerous men being killed and hurt, the pikemen and the spearmen moved forward quickly dispersing the horsemen of the enemy. They were followed by halberdiers, who thrusted, chopped and pulled down the horsemen from their horses with hooks" (Plewczyński 1994, p. 212). It was quite unusual as this formation was, as a rule, a stable point of defence. It was surrounded by detachments using other kinds of weapons, which were pushing the enemy into the centre of fighting.

The presence of pole weapons allowed to treat infantry as a formation which was able to move from distance fire or close order defensive to successful direct encounter with the enemy's horsemen. These are symptoms of changes in armament and tactics of infantry in the first half of the 16th century, which was a transition stage of the 15th century fighting style, and the second half of the 16th century. The Polish infantry at that time, mainly under the influence of Hungarian experiences, transformed into a formation ready to face not only the enemy's fire but also direct encounters (the Lubiszewo battle). It was also able to attack strong points of defence (the Muscovite wars of Stefan Batory) where it also undertook sapper tasks, ranking with called up peasants.

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