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## NEW STUDIES ON ARMS AND ARMOUR IN TEUTONIC PRUSSIA THE PRESENT STATE AND THE PERSPECTIVES

Today, for the second time after fifteen years I have the pleasure to present to you, the historians specializing in old weapons, the needs and the research achievements in the field of the Teutonic arms and armour in Prussia. My first pronouncement, mostly of postulates, was restricted to a large extent to pointing out the vast gaps in our knowledge of the history of arms and armour used in the Teutonic state.<sup>1</sup> Today it has become possible to present examples of the positive results achieved so far.

The first published attempt to estimate the state and the needs of the studies on the Teutonic military history clearly proved how little had been known about the arms and armour used by the warriors enlisted in the service of the Order's troops and demonstrated not so much the knowledge but, rather, the lack of it.<sup>2</sup> The program of research was yet to be worked out. The most essential problem was, then, the recognition of the data stock, particularly the large bulk of the written records as well as the estimation of the usefulness of particular categories of sources for the studies on the Teutonic arms and armour. It was obvious, the studies had to rest on the analysis of all possible categories of sources—historical arms and armour, written records and iconographic materials. Also the most vivid gaps in our knowledge of other elements of the Teutonic military history were indicated in the paper mentioned above.

Without repeating its contents let us only recall the fact there were no larger publications devoted to

arms and armour among the rich and, it seemed, multisided literature on the history of the Teutonic Order. The greatest achievement in the field of researches of the Teutonic arms and armour were then: G. Bujack's paper, published in 1888<sup>3</sup> and the cycle of short reports on arms and armour prepared on the basis of the written records and iconographic data by B. Engel.<sup>4</sup> Despite the fact that there were some remarks about arms and armour in the works of Polish and German medievalists engaged in the studies of the military history of the Order, especially the wars led by it after its settlement in Prussia, they were but short mentions.

The progress in the studies on the Teutonic arms and armour in Prussia could be seen clearly only about 10 years ago. It was due to several reasons.

The end of 1970's brought the program of the Grunwald researches. Its aim was not only to launch archeological researches in the Grunwald Battlefield in order to find some material traces of the battle of 15th July, 1410, including the arms and armour, but also to analyse anew many problems connected with the Polish-Teutonic conflicts.<sup>5</sup> These could not be fully investigated or explained without paying a close attention to the arms and armour used in the course of these military confrontations. Fully aware of the existing gaps in the knowledge of the problems concerning the Order's militaria, of the need to develop researches of these problems, they postulated

<sup>1</sup> Paper delivered in September 1973 at the meeting of the Society for Ancient Arms and Armour at Malbork.

<sup>2</sup> A. Nowakowski, *Stan i potrzeby badań nad wojskowością krzyżacką*, „Pomorania Antiqua”, 1975, VI, pp. 281–293; A. Nowakowski, *Situation und Notwendigkeit der Forschungen nach dem Militärwesen des Deutschen Ordens*, Rapports du III<sup>e</sup> Congrès International d'Archéologie Slave, vol. 2, Bratislava 1980, pp. 329–334.

<sup>3</sup> G. Bujack, *Zur Bewaffnung und Kriegsführung der Ritter des Deutschen Ordens in Preussen*, Programm des Altstädter Gymnasiums für Ostern 1887/1888, Königsberg 1888, pp. 1–22.

<sup>4</sup> B. Engel, *Waffengeschichtliche Studien aus dem Deutschor- densgebiet*, „Zeitschrift für Historische Waffen- und Kostüm- kunde”, 1900–1902, 2, pp. 94–102, 174–175, 348–351; 1902–1905, 3, pp. 37–40 1906–1908, 4, pp. 118–123; 1909–1911, 5, pp. 12–15; 1912–1915, 7, pp. 136–139.

<sup>5</sup> Cf. A. Nadolski, *Z problematyki archeologicznych badań Pola Grunwaldzkiego*, „Komunikaty Warmińsko-Mazurskie”, 1980, 2, s. 123–132.

undertaking more thorough studies of the Teutonic army, with a special attention given to arms and armour.<sup>6</sup>

A significant factor aiding successfully the development of such researches was the intensification of excavation work in the so-called conical mottes i.e. knights' residential-defensive seats, quite a lot of militaria to be found in their ruins. A number of interesting pieces of historical arms and armour were acquired, particularly valid discoveries were made in the Chełmno district.<sup>7</sup> The consciousness of the existing gaps in our knowledge of the Teutonic arms and armour, a numerical increase of authentic historical objects, as well as a better investigation of other categories of sources – all these rendered it possible to think realistically about carrying out in practice at least some research needs. It would not be, however, possible was it not for the development of the studies on the medieval arms and armour in Poland.

Thus, in recent years the studies on the arms and armour in the Teutonic state have been considerably accelerated mainly owing to the work undertaken by the Polish experts on arms and armour. The progress made in the investigation of the arms and armour and the equipment used by the warriors in service of the Teutonic troops is closely connected with the emergence of the Polish school of the study of arms and armour in the Middle Ages.<sup>8</sup> Let us state in all certainty that the results achieved in this field are considerable and the investigations of the Polish medieval arms and armour belong to the most actively developing fields of study of this epoch. The methods worked out in the meantime and the ways of scientific procedure could be used successfully during the studies on the Teutonic arms and armour in Prussia.

What is, then, the present state of researches in the field under consideration like? If we accept the level of our knowledge of the subject from before 15 years – which, as we know, was quite low – as a point of reference, a meaningful, significant progress can be noted. This concerns almost all spheres of our knowledge of the military equipment used by the warriors

forming the Teutonic forces. It was already pointed out by A. Nadolski in the article describing the studies of medieval arms and armour in central-eastern Europe.<sup>9</sup> Let us complete the image presented by this researcher with some significant details.

The history of the Teutonic weapon in Prussia covers almost exactly the period of three centuries. These are the years of vast changes in the history of the European weapons. The warriors of the first half of 13th century, i.e. from the period of the beginnings of organization of the Teutonic state in Prussia differed greatly, as far as their arms and armour were concerned, from their fellow-warriors from the times of the Order's secularization. Those deep differences, which we may doubtlessly call different values make it necessary to take a different research approach, a different methodological look at the arms and armour as well as the phenomena accompanying it. Let us remember the studies of arms and armour are connected with almost all life spheres of the Middle Ages. The military matters were closely connected with the social structure, the state organization, a degree of technological development etc.<sup>10</sup> In turn, those phenomena were greatly transformed during the centuries of the Prussian chapter in the history of the Order.

It was impossible to investigate thoroughly the complicated history of the Teutonic arms and armour in such a short time, since the moment a serious study of these problems had begun.

In 1958 a book by A. Nickel was published in which the author, while describing the medieval shields of oriental origin, mentioned also some varieties of this weapon used in the Teutonic armies.<sup>11</sup> It was the first, after a long break,<sup>12</sup> publication devoted to the Teutonic arms and armour, based on the analysis of particular historical data, mainly some iconographic sources.<sup>13</sup> Unfortunately, in other

<sup>9</sup> General information on the state of research on the Teutonic arms and armour see *ibidem*, pp. 50–55.

<sup>10</sup> A. Nowakowski, *Historia uzbrojenia a dzieje polskiego średniowiecza*, „Wiadomości Historyczne”, 1983, XVI, 3, pp. 187–190.

<sup>11</sup> H. Nickel, *Der mittelalterliche Reiterschild des Abendlandes*, „Inaugural-Disertation zur Erlangerung des Doktorgrades der Philosophischer Fakultät der Freien Universität”, Berlin 1958.

<sup>12</sup> The latest publication on the Teutonic arms and armour preceding H. Nickel's paper was an essay by B. Rathgen, *Die Pulverwaffen in Deutschordensstaat von 1362 bis 1450*, „Elbinger Jahrbuch”, 1922, 2, pp. 76–96.

<sup>13</sup> Cf. S.M. Kuczyński, *Wielka Wojna z Zakonem Krzyżackim w latach 1409–1411*, Warszawa 1955 – the subsequent editions do not bring any changes in the chapter on arms and armour; H. Gersdorf, *Der Deutsche Orden im Zeitalter der polnisch-litauische Union*, Marburg a. Lahn 1957; F. Benninghoven, *Die Gotland Feldzüge des Deutschen Ordens 1398–1408*, „Zeitschrift für Ostforschung”, 1964, 13, 3, pp. 34–66;

<sup>6</sup> M. Biskup, *Stan i potrzeby badań nad państwem krzyżackim w Prusach (w. XIII – początek XVI)*, „Zapiski Historyczne”, 1976, XLI, 1, pp. 29–31.

<sup>7</sup> The most numerous set of militaria has been found at Plemięta near Grudziądz see *Plemięta. Średniowieczny gródek w ziemi chełmińskiej*, ed. A. Nadolski, Toruń 1985, pp. 85–128.

<sup>8</sup> An evaluation of the state of research on the Polish medieval arms and armour had been recently given by A. Nadolski, *Die Forschungen über die Bewaffnung des Deutschen Ordens und seiner Gegner in Ostmitteleuropa* [in:] *Werkstatt des Historikers der mittelalterlichen Ritterorden. Quellenkundliche Probleme und Forschungsmethoden*, hrsg. H.Z. Nowak, „Ordines Militares. Colloquia Toruniensia Historica”, 1987, IV”, pp. 55–59.

medievalists' publications issued at that time, or a little later, describing the wars led by the Order and analysing other problems of the military history of the Teutonic knights, very little was said about arms and armour.

Successive publications on arms and armour had to be waited for up till 1973 when the papers of A. Nadolski and A. Nowakowski appeared, partly stimulated by their intention to argue with the faulty, in both authors' opinion, conception of H. Nickel.<sup>14</sup> Since that moment a new phase of the study of the Teutonic arms and armour began, undertaken by the Polish experts on weapons. Unfortunately, only some researchers from other countries included these problems in the sphere of their interests.

Estimating the present day state of our knowledge of arms and armour of the warriors forming the Teutonic military forces let us pay a close attention to the characteristic placing of stresses, to visible unevenness in the so-far knowledge of the history of the arms and armour used in the Teutonic state.

So far there has been no monograph concerning the weapons that would cover the whole period under investigation, i.e. the years from the second quarter of the 13th century up till the second quarter of the 16th century. Neither the book by the author of the present paper – discussing the chosen problems of the Teutonic military forces, since the moment of the Order's settlement in the Chełmno region up till its

secularization<sup>15</sup> – can aspire to be estimated as the one to do it. The data included in it, about the kinds and types of arms and armour, problems connected with their production and distribution especially in the 13th c. and 1430–1525 could be still enlarged and supplemented.

Much more has been known about the arms and armour used in Teutonic Prussia in the 14th century and at the beginning of the 15th century. The monographic work by Andrzej Nowakowski came out, in which all kinds of sources were used for the studies of the medieval weapons and the equipment of the warriors enlisted in the service of the Order's troops.<sup>16</sup> The author tried to reconstruct the kinds and types of the arms used in battle not only by knights and castle garrisons but also the rest of combatants forming the Teutonic army. He pointed out by the considerable variety, both typological and chronological, of the Teutonic arms and armour as well as the Baltian influences, particularly visible in the defensive arms. In his book Andrzej Nowakowski argues against the opinion according to which a Teutonic warrior was a knight armed exclusively according to the latest military fashion, dominating over his Baltian and Slavic opponents with the high quality of his arms. The author did not take into consideration fire arms in his publication since they had been analysed earlier by V. Schmidtchen with the use of the information included in the written records.<sup>17</sup>

It seems, however, that the most essential effect of the studies on the Teutonic militaria in the 14th c. and the beginning of the 15th c. was an attempt to determine the names of contemporary arms explaining some source terms denoting various types of arms and equipment used in the situation in which so few authentic historical objects were preserved up till the present day and not very rich iconographic materials existed – written records and especially all kinds of cash books, inventories of castles, town records etc. offered real perspectives for sincere study.

In the last few years some works on the Teutonic arms and armour appeared in which their authors freely made use of the results of the review of this kind of sources. Let us recall here two papers devoted to the analysis of the contents of castle arsenals in 1362–1431 and at the beginning of the 16th cen-

F. Benninghoven, *Die Kriegsdienste der Komturei Danzig um das Jahr 1400*, [in:] *Acht Jahrhunderte Deutscher Orden in Einzeldarstellungen*, Bad Godesberg 1967, pp. 192–196; F. Benninghoven, *Zur Technik der spätmittelalterliche Feldzüge im Ostbaltikum*, „Zeitschrift für Ostforschung”, 1979, 19, 4; S. Ekdahl, *Der Krieg zwischen dem Deutschen Orden und Polen-Litauen im Jahre 1422*, „Zeitschrift für Ostforschung”, 1964, 13, 5; S. Ekdahl, *Über die Kriegsdienste der Freien im Kulmerland zu Anfang des 15. Jahrhunderts*, „Preussenland”, 1964, 1; S. Ekdahl, *Schiffskinder im Kriegsdienste des Deutschen Ordens. Ein Überblick über die Werbungen von Seeleuten durch den Deutschen Orden von der Schlacht bei Tannenberg bis zum Brester Frieden*, „Acta Visbyensia”, 1983, XI; M. Biskup, *Trzynastoletnia wojna z Zakonem Krzyżackim 1454–1466*, Warszawa 1967. *Zarys dziejów wojskowości polskiej do 1864 r.*, Warszawa 1965, edited by eminent historians does not contain any mention of the Teutonic arms and armour although, in view of the wars waged by Poles with the Order, the problem ought to have been discussed. Similarly, in the publications of experts on arms and armour the Teutonic weapons have not been mentioned at all, cf. Z. Żygulski (jun.) *Broń w dawnej Polsce na tle uzbrojenia Europy i Bliskiego Wschodu*, Warszawa 1975.

<sup>14</sup> A. Nadolski, *Influences balto-slaves dans l'armement des Chevaliers Teutoniques*, [in:] *Berichte über den II Internationalen Kongress für Slavische Archäologie*, Bd 3, Berlin 1973, pp. 33–36; Polish version *Niektóre elementy balto-słowiańskie w uzbrojeniu i sztuce wojennej Krzyżaków*, „Pomorania Antiqua”, 1974, VI, pp. 165–173; A. Nowakowski, *Przyczynki do poznania tak zwanej zbroi mazowieckiej*, „Kwartalnik Historii Kultury Materialnej”, 1973, XXXI, 2, pp. 289–298.

<sup>15</sup> A. Nowakowski, *O wojskach Zakonu Szpitala Najświętszej Marii Panny Domu Niemieckiego w Jerozolimie zwanego krzyżackim*, Olsztyn 1988.

<sup>16</sup> A. Nowakowski, *Uzbrojenie wojsk krzyżackich w Prusach w XIV w. i na początku XV w.*, Łódź 1980.

<sup>17</sup> V. Schmidtchen, *Die Feuerwaffe des Deutschen Ritterordens bis zur Schlacht bei Tannenberg 1410*, Lüneburg 1977.

tury.<sup>18</sup> Their author determined the types and the kinds of arms stored there, estimated the quantity of the arms stock, pointed out their drastic decrease shortly after the great war of 1409–1411; he also made an attempt to answer who the arms hidden in the Order's castles were meant for. The publication by W. Świętosławski is of the same character, describing the castle saddle-making workshops: the organization of production, kinds of saddles, raw materials and technique of horse-harness making, prices, the potential production of saddle-making workshops.<sup>19</sup> It is also worthwhile to pay one's attention to the paper in which the authors tried to compare, using for this purpose Polish and Teutonic written records, the personal armour of Grand Master Ulrick von Jungingen and his opponent in the Battle of Grunwald – the Polish King Władysław Jagiełło<sup>20</sup>.

The written sources were also used by M. Biskup in his works on the Teutonic fire arms. These were, however, agendas of artillery and hand fire arms, so the author did not go into any deep typological analysis or estimation of the values of these weapons.<sup>21</sup>

The recent period brought also few but precious publications devoted to authentic historical arms coming from the area of Teutonic Prussia. The most valuable of them, since it comprised both the system of offensive and defensive arms, was the documentation of the finds at Plemięta near Grudziądz<sup>22</sup>. Two kettle hats, a fragment of the coat of plates and other arms were found in the ruins of the burnt down residential-defensive tower belonging to the Chełmno knight – unique in the Teutonic state and in Europe. The important conclusion following from the analysis of the finds in the little motte could be the statement

that, at the beginning of the 15th century – it was burnt down in 1414 – the arms found there were not exactly modern. An extremely interesting discovery was made in the ruins of the manor-house at Słoszewy near Brodnica, belonging to the Order's chain and destroyed probably in 1414.<sup>23</sup> Over a thousand of boltheads of crossbows kept in wooden boxes were come across. The weapons were produced in the same place.<sup>24</sup> Recent years brought an extremely fascinating discovery of the breast plate armour, so far the only one in Prussia, which can be associated with the term "brüst", known from some written sources.<sup>25</sup> It is also worthwhile to recall the second presentation of the helmet-basnet in the regional museum in Toruń. The basnet combined both western and eastern qualities and was known in the Teutonic written records as "pekilhube".<sup>26</sup> Single examples of the arms were found at different times during excavation works led in various archeological sites, as well as in the course of casual discoveries. Some of them were registered in more general studies.<sup>27</sup>

The publications on the arms and armour which make use of the analysis of iconographic materials are few. This situation is due not only to the scarcity of sources but also their incomplete documentation, particularly as far as the materials of the last years of the Teutonic state in Prussia are concerned.

So far, the Prussian iconography served as the basis of consideration only for the discussion of the Baltic influences, on the genesis of hand pavise, the shield, commonly met all over central Europe, also

<sup>18</sup> A. Nowakowski, *Arsenale zamków krzyżackich w Prusach w latach 1362–1431*, „Acta Archaeologica Lodziensia”, 1986, 31, pp. 44–99; A. Nowakowski, *Arsenale zamków krzyżackich w Prusach na początku XVI wieku*, „Acta Archaeologica Lodziensia”, 1986, 32, pp. 43–60.

<sup>19</sup> W. Świętosławski, *Zamkowe siodlarnie krzyżackie w Prusach*, „Kwartalnik Historii Kultury Materialnej”, 1986, XXXIV, 4, pp. 649–663.

<sup>20</sup> J. Danka, A. Nowakowski, *Osobiste arsenale Władysława Jagielly i Ulryka von Jungingen w świetle współczesnych rachunków*, „Kwartalnik Historii Kultury Materialnej”, 1981, XXIX, 1, 21–34.

<sup>21</sup> M. Biskup, *Wykaz broni palnej i innego sprzętu wojskowego wysyłanego przez Toruń w okresie wojny trzydziestoletniej*, „Zapiski Historyczne”, 1966, XXXI; M. Biskup, *Wykaz sprzętu artyleryjskiego Zakonu Krzyżackiego w Prusach z około 1523 r.*, „Komunikaty Warmińsko-Mazurskie”, 1985, 1–2, pp. 97–103.

<sup>22</sup> Cf. note 7. Side arms, shaft arms and butt arms have been discussed by M. Głosek, missile weapons by A. Kola nad G. Wilke, defensive arms by A. Nadolski and E. Grabarczykova, elements of horse harness and of equestrian equipments by A. Nowakowski.

<sup>23</sup> G. Wilke, *Późnośredniowieczny dwór obronny w Słoszewach koło Brodnicy w świetle badań archeologicznych*, [in:] *Średnio-wieczne siedziby rycerskie w ziemi chełmińskiej na tle podobnych obiektów na ziemiach polskich*, Toruń 1987, pp. 91–99; cf. also A. Kola, G. Wilke, *Późnośredniowieczne siedziby rycerskie na ziemi chełmińskiej w świetle badań archeologicznych w Słoszewach i Plemiętach*, „Acta Universitatis Nicolai Copernici”, Archeologia, 1980, 6, pp. 65–87.

<sup>24</sup> A. Kola, G. Wilke, *Zespół grotów beltów do kuszy z grodziska późnośredniowiecznego w Słoszewach koło Brodnicy w świetle odkryć z 1973 r.*, „Zapiski Historyczne”, 1976, XLI, 1, pp. 81–127.

<sup>25</sup> R. Franczuk, T.J. Horbacz, *Fragmenty późnośredniowiecznej zbroi z zamku krzyżackiego w Małej Nieszawce*, „Kwartalnik Historii Kultury Materialnej”, 1987, XXXV, 2, pp. 219–234.

<sup>26</sup> M. Głosek, A. Nowakowski, *Średniowieczna przyłbica z Muzeum Okręgowego w Toruniu. Przyczynek do znajomości bałtyjskiego uzbrojenia ochronnego*, „Kwartalnik Historii Kultury Materialnej”, 1980, XXVIII, 1, pp. 53–61.

<sup>27</sup> E.g. M. Lewandowski, *Puginały średniowieczne z ziem polskich*, „Acta Archaeologica Lodziensia”, 1986, 31, pp. 101–119; *Broń średniowieczna z ziem polskich. Katalog wystawy*, ed. A. Nadolski, Warszawa 1978; M. Głosek, *Miecze środkowoeuropejskie z X–XV wieku*, Warszawa 1984.

among the Teutonic knightood.<sup>28</sup> Let us mention here a very valuable critical edition of the works by Jan Długosz "Banderia Prutenorum", i.e. description and drawings of the Teutonic banners won by Poles in the Battle of Grunwald. In his comments to the text and drawings of the sources the author paid some attention to the role and place of banner symbols in the Teutonic armies.<sup>29</sup> As we can see the results of the studies of iconography in reference of the Order's influences are not numerous. In the above situation the first work, by C. Gaier, devoted to the Teutonic arms and armour in the lands beyond Prussia, mainly in the territory of today's Belgium, based on iconography, seems to be the most valuable.<sup>30</sup>

Is it possible to make an attempt at estimation of the so far research achievement in the sphere of the Teutonic arms and armour? We think it useful if only to see how much work there is still before us.

Let us begin with the results achieved so far. The most essential result of the so far researches is shaking the stereotype view found in the works of many historians writing on various aspects of the military history of the Teutonic Order and also functioning in the popular consciousness up till recently. Namely it concerns the conviction about the superiority of the Teutonic arms and armour over the weapons of their Slavic and Baltian opponents, about the warriors—"the steel dressed people" equipped with the most modern, therefore the best, weapons.

In the light of our studies it turned out that the arms and armour used by the Teutonic troops did not differ in the least from the equipment used by the mid-European knighthood, including the Polish knights. Contrary to some worn out cliches not only parts of the Teutonic arms and armour were from the Western Europe. Even in the pre-Grunwald years, i.e. in the brightest period of the Order's history, as we know from the analysis of materials—authentic historical objects, written sources, and iconographic materials—the arms and armour of the warriors enlisted

in the service of the Order's troops did not differ in their shape and style from the average arms and armour commonly used throughout Latin Europe.<sup>31</sup> We did not manage to find any typically Teutonic arms, unless we include the Baltian derived helmets—"pekilhuben", not to be found in other mid- and west-European countries which were not, however, an invention of the Order's armourers but a borrowing. The borrowing was not an expression of technical backwardness of workshops manufacturing these helmets but a reflection of high estimation of their value and usefulness in the fights led in the Prussian-Lithuanian theatre of war, quite normal in the war practice.<sup>32</sup>

The results of the latest researches clearly prove it is not possible to speak about standarization of arms and armour used by various combatants in Teutonic Prussia. It consisted of the variety of weapons originated in the Baltian cultural circle and imported not only from western Europe but also eastern Slavic countries; on the other hand, everything seems to prove that the majority of weapons were manufactured in local workshops in castles, towns and villages. It is a typical medieval phenomenon, since the medieval weapons were of irregular scope, partly due to borrowing foreign patterns, partly—the result of the import of weapons or some of its parts. A number of sources of weapons, including, of course, the local military craftsmanship determined the variety of its types and kinds.<sup>33</sup> Thus we should not be surprised at the appearance of helmets and shields of a Prussian type beside Russian pauldrons, Scandinavian crossbows, South German swords or Hungarian bows even in the largest and most important castle arsenals.<sup>34</sup>

The modern military equipment was not always at the disposal of the Teutonic warriors. It is particularly true of the vassals of the Order enlisted in the military service on the basis of endowments they possessed or of local mercenaries—"knechts" i.e. the people who formed the largest group of combatants in the Teutonic army. The finds in the motte at Plemięta constitute evidence for the above statement. The system of weapons and equipment discovered there was not a result of the leading military technology, since it included also the elements already outdated at the moment when the place was conquered and burnt down.<sup>35</sup> Also the weapons kept in

<sup>28</sup> A. Nowakowski, *Jeszcze o genezie pawęży. Uwagi na marginesie książki A.N. Kirpicznikowa, „Kwartalnik Historii Kultury Materialnej”*, 1980, XXVIII, 1, pp. 111–115; A. Nowakowski, T.H. Orłowski, *Dwa przedstawienia uzbrojenia bałtyjskiego w średniowiecznej plastyce figuralnej z ziem polskich*, „Acta Universitatis Nicolai Copernici”, Archeologia, 1984, 8, pp. 83–95.

<sup>29</sup> S. Ekdahl, *Die Banderia Prutenorum des Jan Długosz – eine Quelle zur Schlacht bei Tannenberg 1410*, Göttingen 1976. Colour photographs of the original pages of manuscript are excellent. K. Górski's work *Jana Długosza Banderia Prutenorum*, Warszawa 1958, contains only simplified drawings of the banners.

<sup>30</sup> C. Gaier, *Quelques particularités de l'armement des Chevaliers Teutoniques dans le baillage de Germanie Inferieure aux XIV<sup>e</sup> et XV<sup>e</sup> siècles*, „Fasciculi Archaeologiae Historicae”, 1986, 1, pp. 27–32.

<sup>31</sup> A. Nowakowski, *Uzbrojenie wojsk krzyżackich...*, pp. 142–148.

<sup>32</sup> A. Nowakowski, *O wojskach...*, p. 160.

<sup>33</sup> *Ibidem*.

<sup>34</sup> A. Nowakowski, *Uzbrojenie wojsk krzyżackich...*, p. 144.

<sup>35</sup> Coat of plates, obsolete form of sword or certain spurs can be included here, *Plemięta. Średniowieczny gródek...*, pp. 91,

castle arsenals were sometimes most old fashioned, for example, in the castle of Szeszno in 1516 hound-skulls could be still found.<sup>36</sup> All this seems to prove that, apart from the brothers-knights, the full plate armour was only at the disposal of the richest spearmen so it cannot exemplify the arms and armour of the whole army.<sup>37</sup>

Presently we have at our disposal some information on the Teutonic arms and armour in the second half of the 14th c. and at the beginning of the 15th c. It seems that the hitherto literature created a rather full and faithful image of it. Definitely it still requires some complementation, yet, it seems, they cannot change our image of the reconstructed phenomena in a revolutionary way.

Let us now present the most essential research needs in the field of arms and armour of the Teutonic Order in Prussia and consider the perspectives and possibilities of their practical realization. The author of these words is of the opinion that the program of the required researches can be determined without much difficulty and a list of needs can be made. However, the needs and the possibilities of their realization are not always in accordance with each other.

Beyond any doubt it is necessary to intensify, or in fact to undertake, the deepened studies of the arms and armour used in Prussia at the beginning of the Teutonic state and in the last century of its existence. Unfortunately, as it can be suspected, the task is neither going to be easy nor possible to realize in the near future. The appearing difficulties are not always possible to be overcome, for the reasons independent of experts on the arms and armour, since they are caused by some objective reasons: poor source data and their inadequate analysis.

The researcher undertaking the studies on the Teutonic arms and armour of the 13th century is confronted with multiple difficulties following from the lack of adequate number of data of all categories. The lack of written records and iconographic materials which are useful for the study of weapons is particularly severe.<sup>38</sup> Although the remaining nar-

99–100, 136; Cf. also B. Thordemann, *Armour from the Battle of Visby 1361*, Stockholm–Uppsala 1939–1940, p. 224; R.E. Oakeshott, *The Sword in the Age of Chivalry*, New York 1965, pp. 37–41.

<sup>36</sup> A. Nowakowski, *Arsenaly...*, p. 47.

<sup>37</sup> On the full plate armour in the equipment of Polish knights cf. A. Nadolski, J. Dankowa, *Uwagi o składzie i uzbrojeniu polskiej jazdy rycerskiej w latach 1350–1450*, „Studia i Materiały do Historii Wojskowości”, 1983, XXVI, pp. 91–110.

<sup>38</sup> On the usefulness of sources for the study of Teutonic Order's arms and armour cf. A. Nowakowski, *Uzbrojenie wojsk krzyżackich...*, p. 27–28.

rative sources and documents left at the disposal of the researcher are important for the study of other problems of the military history, they are most often of little carrying value in the analysis of the arms and armour, for the descriptions of weapons included in them are brief and schematic.

There is little hope of our finding new sources, unknown today, that would enable us to fill up the existing gaps in the bulk of the written records. Neither the iconographic materials dated in the 13th century are likely to become more numerous and it is hardly possible to expect some surprises still awaiting the experts on arms and armour.

The only practical research possibilities seem to rest in authentic pieces of historical weapons of that period coming from archeological investigations, therefore well dated and connected with a clearly defined cultural context. Today, however, a number of military pieces discovered in the archeological sites is extremely small which makes it impossible to put forward any more general conclusions. In this situation, it seems, the intensification of archeological investigation should be postulated, especially on the so-called conical mottes hiding the remains of the seats of civil feudal lords as well as in the castles put up by the Teutonic knights. A more considerable multiplication of the archeological sources is, however, not possible in the nearest future, even if we assume funds on the researches are raised and we are lucky enough to find the site attractive in terms of quality and quantity of the finds. Excavation works usually last for several seasons, the found historical objects require documentation, an essential analysis, not to mention conservation. Thus, putting them in a scientific circulation requires some time.

There are also a lot of difficulties faced by the expert on the weapons who would like to investigate the Teutonic arms and armour in the period of 1466–1525. Those troubles, however, are due to some other reasons. The basic one is an almost complete lack of the recognition of the written sources in terms of their applicability to the study of arms and armour. Such studies are yet to be undertaken. Let us add that a greater part of the written records of this period still remains in manuscripts stored in the Polish and German archives. Using them requires a special paleographic preparation, the experts on weapons do not have, as a rule. Co-operation with historians, which has not been started yet, seems to be essential. It seems the perspectives of acquiring some interesting information about the Teutonic arms and armour used in the last years of the Teutonic state in Prussia are quite real as we learn from the written records lately discovered in the

archives (from the beginning of the 16th century).<sup>39</sup> The iconography of Teutonic Prussia of that period is completely unknown; we cannot note any authentic historical objects, which makes the studies of arms and armour even harder.<sup>40</sup>

The historian dealing with the arms and armour of Teutonic Prussia has got an important task to investigate: the military production and ways of distributing weapons in the Teutonic state. Up till the present day little has been known about the organization of the military production in Teutonic castles, towns and granges. City craftsmanship is relatively best known, particularly in large centres. However, little information is given about the manufacturers of arms and equipment in the existing records while the kinds and the scope of the produced militaria have remained beyond the scope of the researchers' interest.<sup>41</sup>

<sup>39</sup> Recently M. Biskup has discovered a so far unknown source concerning a register of the Teutonic Order's fire arms, cf. M. Biskup, *Wykaz sprzętu artyleryjskiego...*, pp. 97–103.

<sup>40</sup> Albrecht Hohenzollern's is an exception, cf. J. Schöbel, *Prunkwaffen. Waffen und Rüstungen aus dem Historisches Museum Dresden*, Leipzig 1973, p. 27, tabl. 1.

<sup>41</sup> For instance, the latest synthesis of the history of Gdańsk *Historia Gdańska*, ed. E. Cieślak, vol. 1, Gdańsk 1978, does not give any specific information on the arms crafts in this town.

It seems equally important to submit the authentic arms and armour to a specialistic analysis, especially in terms of recreation of the technique of their making. Metalographic analyses have been applied only to some specimens from Prussia. They cannot, therefore, serve as the basis for any generalizations.<sup>42</sup>

Concluding my remarks about the state and the needs of our studies of the arms and armour in Teutonic Prussia let us stress strongly that their further progress depends on the multiplication of source data. Let us hope that the increase of the specimens of militaria discovered in the archeological sites as well as some other categories: written records and iconographic materials will be possible, among others, owing to the studies planned in the program "Grunwald".

*Translated by Ewa Książek*

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<sup>42</sup> Cf. J. Piaskowski, *Technika gdańskiego hutnictwa i kowalstwa żelaznego X–XIV wieku na podstawie badań metaloznawczych*, „Gdańsk wczesnośredniowieczny”, 1960, II, pp. 25–74.

The first part of the paper discusses the importance of the research and the objectives of the study. It highlights the need for a comprehensive understanding of the current state of affairs in the field and the potential implications of the findings. The second part of the paper presents a detailed review of the literature, identifying key trends and gaps in the existing research. This is followed by a description of the methodology used in the study, including the data sources and the analytical techniques employed. The results of the study are then presented, showing the findings and their statistical significance. Finally, the paper concludes with a discussion of the implications of the findings and suggestions for future research.

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