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ARTICLES

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Ten Years of Recruitment for Archaeology in Toruń – Candidate Profiles and the Student Recruitment Process. A Multi-indicator Data Analysis

Abstract

Nalaskowski F., Dejna D. 2021. Ten Years of Recruitment for Archaeology in Toruń – Candidate Profiles and the Student Recruitment Process. A Multi-indicator Data Analysis. *Analecta Archaeologica Ressoviensia* 16, 7–18

The article is a research report on candidates for archaeological studies, for which the source of data was the Internet Candidate Registration (IRK) system of the Nicolaus Copernicus University in Toruń. The analysis was carried out on a sample of 695 people admitted to the first year of archeology at UMK, with the material covering the period from 2007 to 2017. It was decided to build the profile of candidates for students based on six criteria: the size of the hometown and its distance from Toruń, gender, age of the candidates, completed secondary school, results of secondary school-leaving exams and recruitment decisions of candidates (priority system). As researchers, we had no influence on the set of data we had at our disposal, the work was carried out using an already existing database, the primary purpose of which was not research or analyzes similar to ours. The text presents conclusions and generalizations based on proprietary tools for the analysis of the existing database. The conclusions, although they concern archeology itself and candidates for archeology, may be a starting point for further analyzes of other majors. Archaeologists can use these outcomes to evaluate the condition of their discipline.

Keywords: archaeology, university pedagogy, academic education, youth, multi-indicator data analysis, Internet Registration of Candidates, enrollment for studies

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1. Introduction

This text is a report concerning particular academic field of study, archaeology, and the profile of candidates applying to study it. It has been prepared on the basis of data collected by the University Recruitment Committee, which was made available to us by the authorities of the Nicolaus Copernicus University in Toruń. The analyses were conducted in 2018–2019 and the data covers the period from 2007 to 2017. This specific repertoire of data provided the opportunity to conduct analyses only to a limited extent. Potential archaeology students were surveyed and, to the extent that the collected material allowed, conclusions and generalisations about the field of study itself were built on this basis.

The basis for analysis is data collected in the process of enrolling students at the Nicolaus Copernicus University in Toruń in the Internet Registration of Candidates (IRK) system. While registering to study, candidates provide a range of personal information about their previous education and reveal their preferences as to the fields of study.

As researchers we had no influence on the dataset that was available to us, the work was done using an existing database which primary purpose was not research or analysis similar to ours.

The editorial requirements and the profile of the journal resulted in a selective presentation of some of the themes, which in turn are supplemented and clarified in other texts. Here we present content that may be of particular interest to archaeologists or supporters of that field of study.

The data of the archaeology faculty were analysed. We wanted to focus on a traditional academic field, with few enrolments, not too far from our own scientific roots which are pedagogy and sociology. An important motive and driving force behind the work is the "romance" between one of the co-authors, Dr Filip Nalaskowski, and academic and practical archaeology. The choice of traditional and non-mass archaeology (in the sense of mass recruitment that is characteristic for some courses such as Economics) enabled the material to be developed in a relatively short period of time.

The presented study can be treated as a pilot for broader studies for a much larger number of fields of study conducted according to the now developed research strategies and purposes. It is also a text presenting our, author's conception of the study and an attempt to describe young people – candidates for studies. It is a kind of continuation of research projects we have already conducted before, during which we developed our own criteria and methods of researching potentials, plans, capitals and resources of the young generation. However, we decided to devote a separate text to these longitudinal and summary descriptions.

2. Social, economic and cultural context of the research

This study has a clear background, with sources not only in scientific studies but also in our own previous research experience and ethnographic reflections.

During the review process, we met with indications to take a closer look at the social context related to archaeology enrolments, to expose the political-economic threads. The search for explanations, especially in the pedagogical sciences with which the authors are associated, is a key research obligation. We do so in this text, while leaving room for discussion around this issue for the future. As it was written in the introduction, the presented study is a preface to future ones – conducted for the remaining faculties of academic education; humanities, social sciences, and natural and medical sciences. We place the introduction of a comparative element and supplementing it with explanations of a sociological nature in the sphere of plans for the nearest scientific-research future.

The last 10–15 years have not been favourable for the humanities. It has been a period of very dynamic socio-political changes, accompanied by anxiety of the young about their place on the labour market. We are observing a visible turn towards technical and natural sciences, which are presented, i.a. via the media, as the ones that guarantee a stable and prosperous future. In a situation in which young people experience a lack of security and deficiencies in their family's economic capital, the possibility of studies offering a steady job, high earnings and high social prestige is extremely tempting (Grabowska and Gwiazda 2019, 79–94). This perspective, for humanities, including archaeology, is unequivocally unfavourable.

For more than a decade, we have been observing clear attempts to persuade and encourage high school graduates to study the sciences and natural sciences. We are facing an 'anti-campaign' of the humanities and social sciences, which is happening mostly online (Bochenek and Lange (eds.) 2019, 19–25). This is surely not without influence on the shape and quality of enrolments in, among others, archaeology and other humanistic fields of study. Although this, also thanks to its strong characteristics, seems to resist these trends, the drops in enrolments are quite evident. Numerous campaigns ("Girls go to polytechnics", "It for she", "Career fairs in tech&it", "Learn in stem", "New technologies for girls", ordered majors, etc.) certainly have a strong impact on the decisions and choices of high school graduates – which you can see in the data presented below.

However, this trend does not have to be negative for archaeology in Toruń. It is worth recalling that, although fewer people are taking up these studies after 2014, the indicators that make up the measured strength of a candidate are higher. In a word: we have fewer candidates, but they are "stronger". The same is true for the second main variable – the strength of motivation to study. Also here we observe optimistic changes after 2014. Hence, it is only a step from the general conclusion about the correlation between the main variables: the better the candidate for studying archaeology, the more motivated he or she is to study as well.

An interesting conclusion is that the best/strongest candidates are "visitors" from further away, while the weakest student candidates are definitely young citizens of Toruń.

Archaeology, as a traditional and rather image-conservative field of academic education, constitutes,

in our opinion, a kind of lens in which social trends are reflected. The choices of high school graduates are very often dictated by the social expectations of parents, local communities and peers. The economic condition of families and, more broadly, of the country is also important. Also fashion, pop-cultural influences, the historical politics of the country, the intellectual background and – increasingly – the infrastructure of the faculty and department are taken into account. It is also impossible to omit typically image-building promotional activities. Taking into account the above issues, our analyses gain an interesting social dimension. Archaeology has always been, and undoubtedly still is, a field of study that attracts particular adherents, those who are both Romantics and humanists. The functioning of the field, its successes, financial and intellectual foundations tell us a lot about the current situation and atmosphere in the whole country. Therefore, conducting the following analyses was at least twice as interesting for us.

It is also natural to ask what comes after studying archaeology? And just as after pedagogy, which is close to the authors of this text, because of their education and the research issues they take up in their scientific work (strongly contrary to the common beliefs shaped by the headlines), archaeology graduates finish their university education with a ready and complete 'job in hand' and a range of possible employment options. Highly specialised studies and an arsenal of compulsory work placements can be a universal recipe for success and satisfaction in the job market. In addition to the obvious and traditional employment opportunities for an archaeology graduate, such as university, research institutes and, increasingly, museums, new ones are emerging.

Together with the development of infrastructure and the developer market, and the need to adapt building law to EU requirements, there is a growing sector of private archaeological companies and offices carrying out archaeological research and supervision, commissioned by private companies and various building investors. There has also been a growing demand in recent years for the creation of monument registers, mainly commissioned by local authorities. Therefore, archaeology is the study of a specific profession and its graduates have specialist qualifications. In comparison, on the opposite pole of academic education such fields as political science, international relations or management and marketing can be placed.

Below we present, using the form of a research report, a study and an analysis, hoping for an interesting academic discussion on the research procedure.

3. About the study – key information about the research procedure and recruitment for archaeology

As mentioned in the introduction, the source of the data which were used to conduct the analysis for the purposes of this text is the Internet Candidates Registration System at the Nicolaus Copernicus University (called IRK – There is some inaccuracy and in many official documents the anagram IRK is decoded in two ways: Internet Registration of Candidates, and Internet Recruitment of Candidates. We use the first form) and information from the University Recruitment Committee (called URK). We have received permission from the UMK Vice-Chancellor for Student Affairs and Personnel Policy to use and publish data from these sources.

The analysis was conducted on a sample of 695 people admitted to the first year of archaeology at the Copernicus University (s1 – full-time, first degree studies). Candidates recruited in the first and second intake were included.

It should be emphasised that the database at the researchers' disposal was already a ready-made one, which secondary function was to be used for their research. Consequently, the researchers did not have any influence on the set of data contained in it, in other words, they could not ask questions, change any words, expand the scope of research topics.

Although the IRK database is far from perfect and complementary with data of interest to education statisticians, the data set contained in it provides a foundation for conducting basic analyses. According to the information obtained from the IRK data operator, the database has never been used to conduct similar educational research before. It has only been used to prepare simple reports for the POLON system.

The novelty of the analysis presented here is based on the use of IRK to try to answer questions about elements of the characteristics of candidates for a given field of study (archaeology) and an attempt at a deeper analysis of enrolments in this field (and in the future – in other fields of academic education).

The way in which the data set was adapted to the research problems posed also seems interesting and innovative. It was possible to determine important values such as candidate strength (SK) and motivation strength (SM) based on this rather limited data set. The indicators of the variable *candidate strength*, so the "tools" we used to measure/weight this variable are: 1) Type of secondary school completed, 2) Number of matura exams passed, 3) Average score in all matura exams, 4) Recruitment points obtained in IRK and 5)

Success in school subject olympics. The indicators of the variable *strength of motivation* to study archaeology at UMK are: 1) Distance between home and Toruń, 2) Method of prioritisation (information which of the courses chosen by the candidate is the most important for him/her), 3) Year of birth of the candidate.

These issues will not be described in detail in this publication. We refer to them here in order to outline more broadly the scope and nature of the entire research.

When looking for weight values for the described variables, we often had to refer to arbitrary decisions based on our pedagogical knowledge and experiences from conducting similar research, during which we also often used authorial tools to measure variables. Their construction often enforced debatable decisions, the need to undertake expert and public consultations and to refer to autoethnographic experiences and reflections (Dejna and Nalaskowski 2013a; 2015; 2020).

The establishment of these values strongly contributed to the usefulness of the collected data and made it easier to interpret. The topic of strengths is discussed in more detail later in this article.

In the following text, the workshop and methodological aspects are not presented in detail, as they are the subject of separate publications (Dejna and Nalaskowski 2020, 45).

3.1. Characteristics of enrolments in archaeology

The research sample was 695 individuals who applied to become archaeology students between 2007 and 2017. Candidates from both the first and second intake were included in the research. The quantitative distribution across the years is as follows (Fig. 1):

The most numerous intakes (2007–2009) brought 96–112 candidates, the weakest (2014–2015) 18–19. Since 2010, a second intake has been conducted for archaeology (s1). Thus, in the initial years 2010–2011 it brought 17–18 candidates, in the last 4 years it is just amounted to 4–6 people. It should be mentioned that in recent years (since 2015), the formal limit of candidates was 60 people, in earlier years 120.

An initial analysis allows us to make a careful division into 3 periods: prosperity, sharp decline, low stagnation/rebound. These correspond respectively to intakes 2007–2009 (prosperity) averaging 103 admissions, 2010–2014 (sharp decline) from 90 to 19, 2015–2017 (stagnation and gentle rebound) 18–22 candidates.

4. Who are the archaeology candidates and where do they come from? Background of future archaeologists

4.1. Size of hometown and distance from Toruń

In the years 2007–2017 190 candidates declared that they came from the countryside and 505 from cities – of various sizes (Fig. 2). It should be noted here that candidates provided this information themselves when filling in the IRK form, no criteria were given to guide them, and this information was not verified. Our slightly deeper analysis was based on assigning candidates to a location category based on the postal code of their hometown. The categories themselves are consistent with CSO standards, where we have small towns of up to 20,000, medium-sized towns of

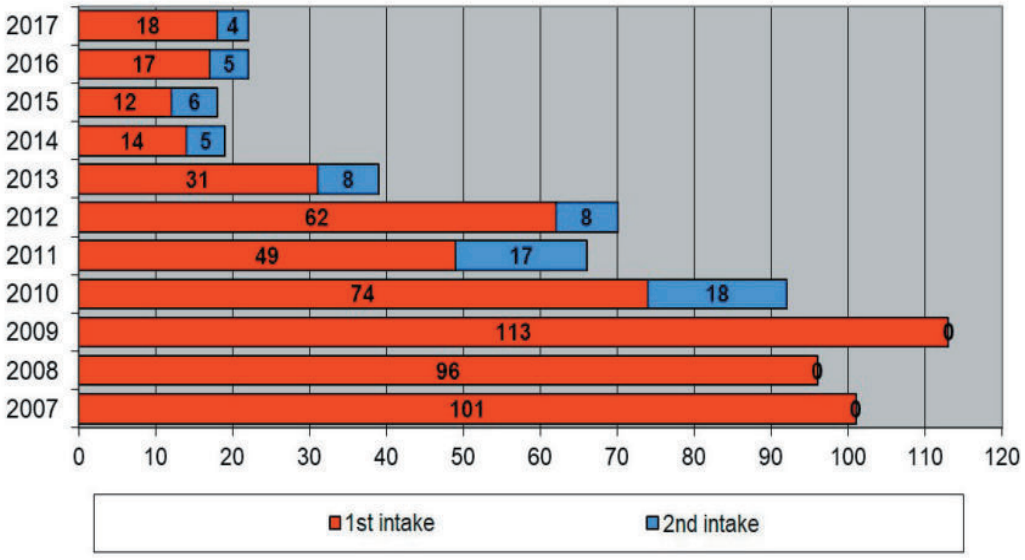

Fig. 1. Number of summer enrolments in the archaeology course.

up to 100,000 and large towns of over 100,000 inhabitants.

More interesting information was provided by data concerning the distance to the Nicolaus Copernicus University. For ease of interpretation, the data was classified into 4 categories (Fig. 3). Distance up to 20 km – candidates from Toruń itself and its immediate vicinity – suburban settlements, communes directly adjacent to Toruń. Between 20 and 100 km – students from the region, those who, in a large number of cases, had the closest proximity to the University, but were often forced to move to Toruń because of the distance. Next, the macro-regional category – from 100 to 200 km, here there are certainly candidates who had alternative universities closer to them and changing their place of residence was a necessity. The last category, of at least 200 km, was the national category, people who very often decided to study at the Nicolaus Copernicus University while skipping several other universities "on the way".

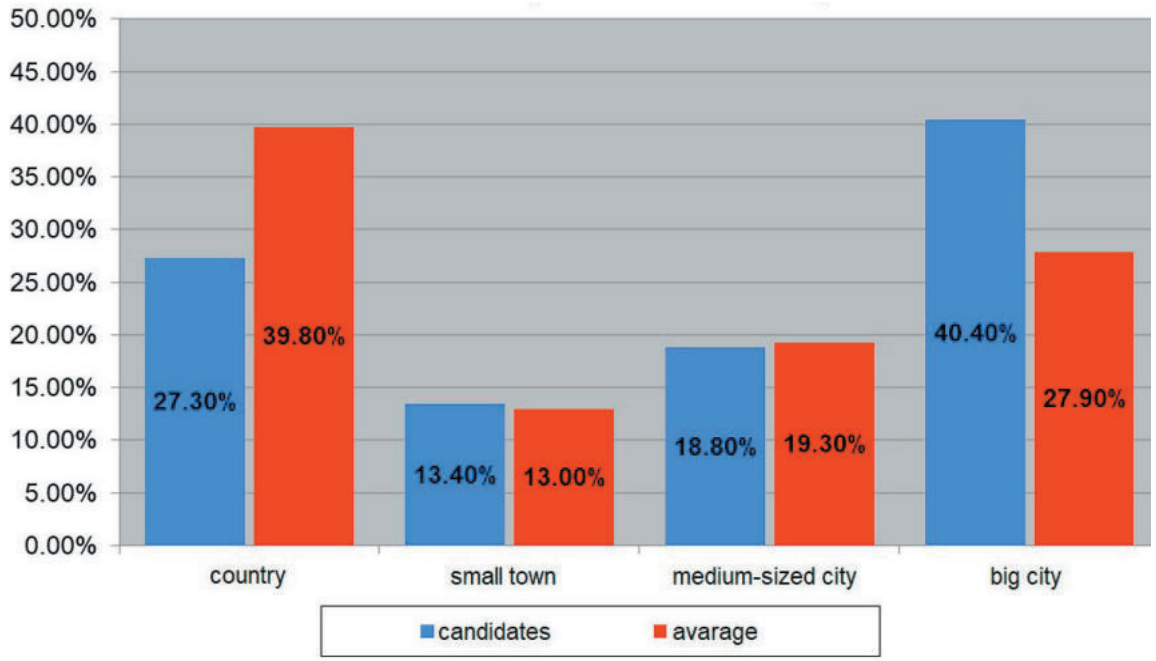

Fig. 2. Candidate origin vs. national average.

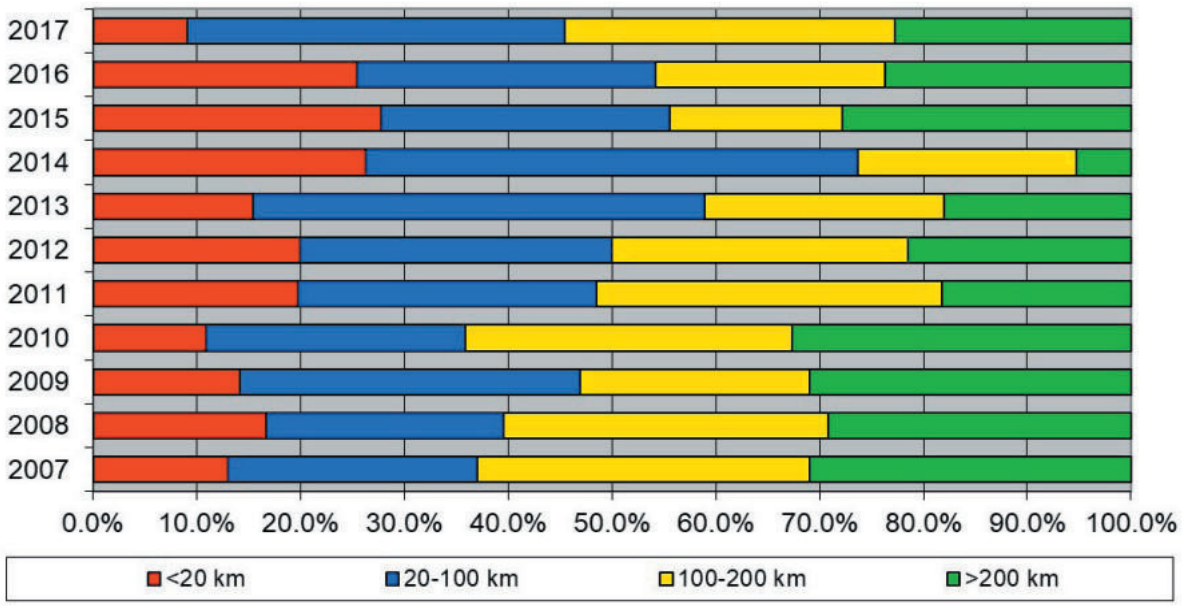

Fig. 3. Distance of candidates' hometown from the Nicolaus Copernicus University.

Figure 3 shows the data in the following years. At first glance there are no clear differences. Although a closer look shows that the first half of the period mentioned was dominated by clearly incomers (100 and more kilometres), in the second period there is an opposite trend – people from the region (up to 100 km) dominate.

The trend noted earlier is also gently emerging. In the years of prosperity, the course was dominated by incomers, as the number of enrolments decreased the enrolments "regionalised", in recent years the number of incomers has slowly increased again.

4.2. Gender

Although gender was not considered as a variable of the highest significance in the study, it is worth noting its distribution over the years (Fig. 4).

It is worth noting at this point the relatively equal distribution of gender proportions with some deviations in 2013 and 2015. In a word of summary, it can be said that on the scale of the 10 years analysed, the faculty is slightly feminised, as 56% (392) of the candidates admitted as students were women.

4.3. Age of candidates

Potentially important information is provided by the graph of the proportion of students' ages by particular years (Fig. 5).

It is important to note that candidates aged 18–19 – i.e. just after matura exam – absolutely dominate, depending on the intake they accounted for between 48% and 82%. It can also be noted that the number of older candidates (20 and over) increased steadily until 2014 (when they accounted for as much as 52% of all those admitted), in the last 3 years we have seen them drop to 18% in 2017.

Juvenile candidates (presumably those sent to the first year of primary school at the age of 6) made a marginal presence in 2007 and 2011.

As a conclusion we can point out some characteristics of an archaeology candidate that distinguish them from other candidates. Firstly, it seems that a passion for archaeology is far more common among young people from large cities (over 100,000 inhabitants) than the national average would suggest, and it is far less common among rural residents than the national average.

Secondly, archaeology, at least that offered at the Nicolaus Copernicus University, is not a 'local' course dominated by local students. Local fields of study are those, where the percentage of students from the same town or area is at least 50%. For this particular course the average value did not exceed 20%. Moreover, it can even be concluded that the geographical distribution of students' place of origin suggests a nationwide scale of faculty (not local, not regional).

The gender ratio is equal, which, contrary to popular belief, is not the case in higher education. In addition, it is interesting to note that this fairly equal gender ratio also applies to later academic staff, although this problem may be the subject of a separate analysis itself.

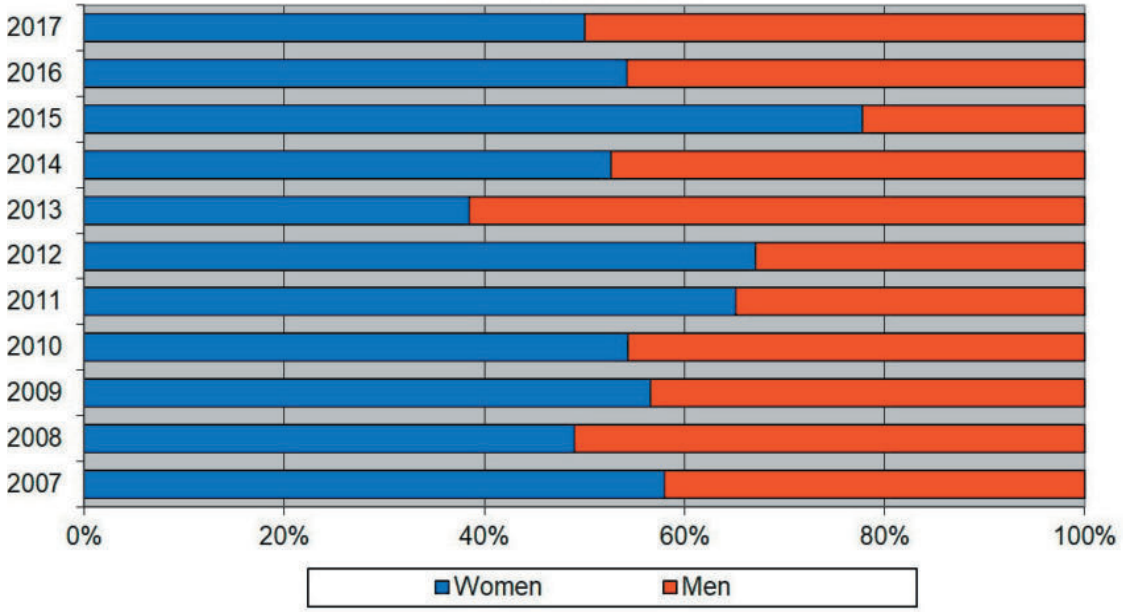

Fig. 4. Gender distribution among university applicants: blue – female, red – male.

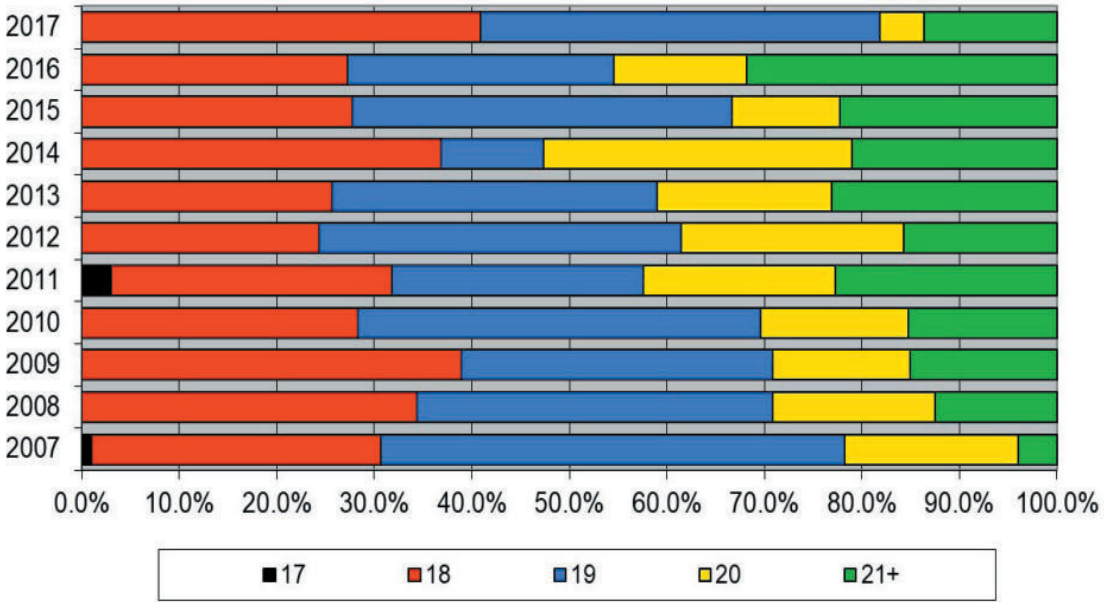

Fig. 5. Age of university applicants by year.

A final peculiarity worth noting is the age proportion. Archaeology attracts a surprisingly large number of people of 'post-secondary' age, i.e. older than 18–19. Importantly, subsequent analysis has shown that these people are not 'dropouts' – students who have failed other courses, but rather people with above average academic results.

4.4. Secondary school

Characteristics of a candidate's secondary school and academic performance at this stage were done in three approaches. The type of secondary school, the "strength" of the secondary school, and the characteristics of the results of the matura exam were taken into account. Firstly, the type of secondary school – comprehensive secondary school (CSS) graduates absolutely dominated in enrolments – they constituted over 93% of candidates (Fig. 6).

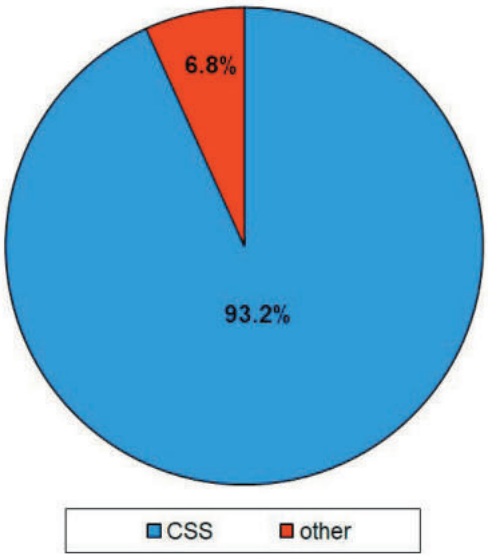

Fig. 6. Type of secondary school completed.

Secondly, the "strength" of this school was taken into consideration. To determine it, we used a somewhat arbitrary rating based on the *Perspektywy* ranking. The magazine publishes a list of the best secondary schools every year, taking into account a number of variables for evaluation. The use of the annual ranking for analyzes covering ten years is justified by the fact that in the period 2007–2017 there were no significant changes in the scope that would potentially affect the findings and explanations. Such decisions were introduced at an early stage of research. We have assumed that candidates, who declare to have graduated from one of the 15 highest ranked schools for a given voivodeship, will be placed in 1st category. Then, we established the 3rd category of schools, which included graduates of technical secondary schools, specialised secondary schools, evening schools and supplementary schools. The middle category (2nd) included all "average" students. To verify this selection, we decided to check whether the type of school category would correlate with the average results of the secondary school

matura exams, where the expected outcome was: the better the school, the better the results.

The results obtained proved to be interesting. As many as 24% of the respondents (168 persons) graduated from one of the 15 best secondary schools in their voivodeship. What is more, only 9% (63 persons) graduated from one of the weakest schools (Fig. 7).

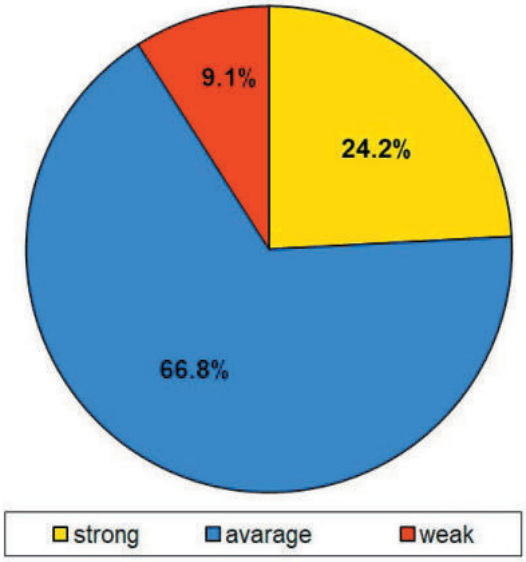

Fig. 7. "Strength of secondary school" measured using the ranking of the magazine *Perspektywy*.

It should also be noted that the aforementioned verification, confirmed the correctness of the classification of schools. In the chart below (Fig. 8) progression is clearly visible – graduates of better schools recorded, on average, higher results on matura exams.

5. Candidates for archaeological studies – a multi-indicator analysis of the educational thread

5.1. Candidates' matura results

The last part that characterises the path to university is the results of the matura examinations. The analysis of this element was made particularly difficult by the multiplicity of variables involved. These issues are analysed in detail in a separate study. Here we only want to signal the most interesting conclusions.

English was an especially favoured language among young archaeologists (90%), far ahead of German (9%). When assessing students as young archaeologists we have to pay attention to their interests related to archaeology. Thus, only slightly more than half of the candidates took History as their matura exam subject, but 10% took the rather "exotic" History of Art. Sometimes indicated as related and helpful to archaeology, biology and geography were selected by 9% and 30% respectively.

It is interesting to note that Latin, until recently considered very useful for archaeology, was only declared by 4 students in 11 years of recruitment. A comment on Mathematics is also worth mentioning. Mathematics has been a compulsory examination since 2010. This means that in the discussed period, three years (2007–2009) did not have to deal with it, and eight (2010–2017) already had this obligation. It turns out that only half (346 people) of all young students took this exam in either version, this means that while eight year groups had no choice but to take Mathematics, among the initial year groups, in

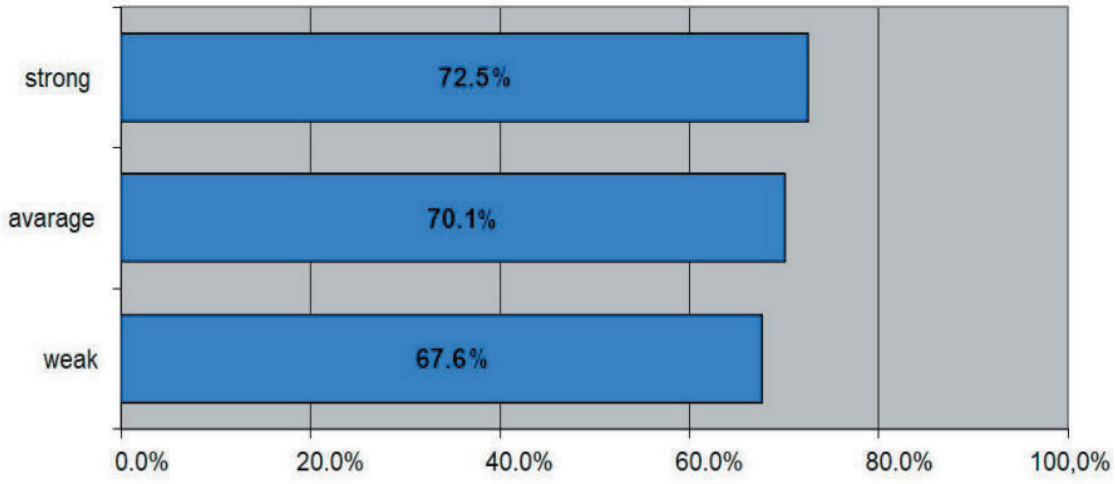

Fig. 8. Average matura exam results of school graduates in each of the assumed categories: strong, average, weak.

a choice situation, almost no one (26 out of 310 people) took the Mathematics exam.

The analysis of the data obtained shows that, in general, archaeology students score above average on the matura exam. They score best in History, Geography, Political Science and English. The most difficult subjects are science and natural sciences (mathematics, chemistry, biology) and German. On the basis of these data, it is also possible to characterise next first year students.

Thus, in the light of the method used by us, the last three years' students stand out, "winning" ¾ of the contests with the average. Clearly *in minus* are the "declining" years: 2010 and 2014, which were defeated in most categories on national averages.

Other year groups were slightly, and sometimes significantly, better than the comparable averages, which allows us to maintain the thesis stated at the beginning that we are dealing mainly with candidates who are above average in their matura examinations.

5.2. Candidate priorities in the recruitment process at the Nicolaus Copernicus University – archaeology vs. the competition

In order to fully interpret the results of the recruitment process at the Nicolaus Copernicus University, it is necessary to familiarise oneself with its rules. Candidates applying for admission in the first intake for full-time first degree studies choose any number of courses they are interested in – this should be treated as initial interest. Then they pay a fee for each indicated course – which is already a serious declaration, because it is related to costs. They rank the courses they have chosen and paid for in order: from the one they care most about (priority 1) to those they care less about (priority 2, priority 3, etc.).

Firstly, it is worth looking at what priority the discipline had for future archaeology students at the time of recruitment – we called this the strength of priority. For as many as 84% of candidates archaeology was number one on their list of priorities – this is what they cared about most – in this case the candidate showed the highest priority strength. The most frequent competition for archaeology was History – 96 people also applied for it, but note: for none of the respondents it was a higher priority (sic!) – none of the young archaeologists would prefer to be on History. Then there are many other disciplines related to archaeology: archival science, ethnology, cultural heritage protection, art history, cultural studies, conservation. Significantly, in almost all cases (apart from conservation) archaeology was much more often indicated as the main priority. In fact, among young archaeologists their discipline has always won in the competition of priorities. The group of courses breaking out of this trend is relatively small: law, conservation, internal security – these tended to be ranked higher than archaeology as alternatives.

In light of this interpretation of candidates' declarations, it can be concluded that only less than 5% of archaeology students can be said to be at risk of being unfulfilled adepts in other academic disciplines.

It is also quite interesting to note that the strength of each candidate's priority for archaeology was juxtaposed with the distance of their hometown from the University. This comparison revealed that the further away a candidate was from the Nicolaus Copernicus University, the higher priority they tended to give to archaeology. For just over 80% of respondents from Toruń, archaeology was the highest priority, and for 95% of respondents who had more than 200 km to the UMK.

5.3. Candidate Strength (SK) and Motivation Strength (SM) – variables characterising archaeology candidates

Creating the characteristics of archaeology candidates from the data available through the Online Candidate Registration System, we identified two key variables – candidate strength (SK) and motivational strength (SM). These variables were matched with indicators to produce a kind of interesting tool that allows for a deeper description of candidates for the purpose of e.g. creating promotional campaigns for archaeology as an academic discipline, modifying the educational offer or even building an image of archaeology and archaeologists.

A detailed description of the construction of variables and the selection of indicators can be found in another study (Dejna and Nalaskowski 2021). Here we only signal another aspect of the described research. Candidate strength is a value that describes, based on the data available to us, the intellectual and cultural potential of a candidate. The indicators of the variable candidate strength, and therefore the "tools" we used to measure/weight this variable are: 1) The type of secondary school completed, 2) the number of matura exams passed, 3) The average score of all matura exams, 4) The recruitment points obtained in the IRK, 5) If they had won a major competition or *Olympiad*. It was considered that the variables indicated were the closest to reflect the essence of what the candidate's

strength was referred to. The values obtained in the above-mentioned categories were put into an algorithm which allowed calculating a single, unified, value. By measuring this value, we get an answer to the question of whether a candidate is likely to be a strong academic student. The second category, strength of motivation, answers the question of how determined a candidate was to take up a particular course of study. The indicators of the variable strength of determination to study archaeology at UMK are: distance of residence from Toruń, method of prioritisation (information on which of the fields of study chosen by the candidate is the most important for him/her), class year. As in the case of candidate strength also here a unifying algorithm was used. The measurement of this value clears up doubts about random choices of the field of study and provides answers to questions about possible alternatives (Dejna and Nalaskowski 2021).

What do the analyses reveal? Among other things that: 1) The further away a candidate has to UMK, the better intellectual/cultural "coming generation" he/she is most often, the weakest candidates are from Torun itself. 2) We have only few accidental and completely unsuitable candidates, and the decision to study archaeology seems to have been well thought out. 3) Those from rural areas recorded a slightly higher motivational strength but were noticeably less prepared for study – SK. 4) No statistically significant differences emerged in relation to SM and SK in the context of gender. 5) candidates with lower SM and SK are accepted in the second intake. While SM remains unchanged, a difference is drawn in SK, i.e. in the second intake similarly motivated candidates are accepted but they are less prepared.

6. Summaries and conclusions

The data presented enables certain conclusions to be drawn. Firstly, there is a clear trend of decreasing popularity of the described course over the years. This trend can be divided into a period of "prosperity" and "decline". In the first period, a higher percentage of "incoming" candidates was recorded. In the second period 'locals' began to predominate. Moreover, as it has been shown, with the decline in popularity came a tendency to accept candidates with relatively weaker results from the matura examination. Nevertheless, it must be stressed that candidates for archaeology are, in relation to the national average, those with higher results and often graduates of outstanding schools. Archaeology is also more likely to be taken up by urban and more mature young people. Also compared to other competing disciplines, applicants are more decisive and consistent in their choice.

It is also possible to make a rather bitter observation about universities. On the one hand it is possible to hear complaints about students in the corridors of universities, or more precisely "archaeological" ones – certainly not everywhere and not always. However, as a researcher myself, I have more than once witnessed

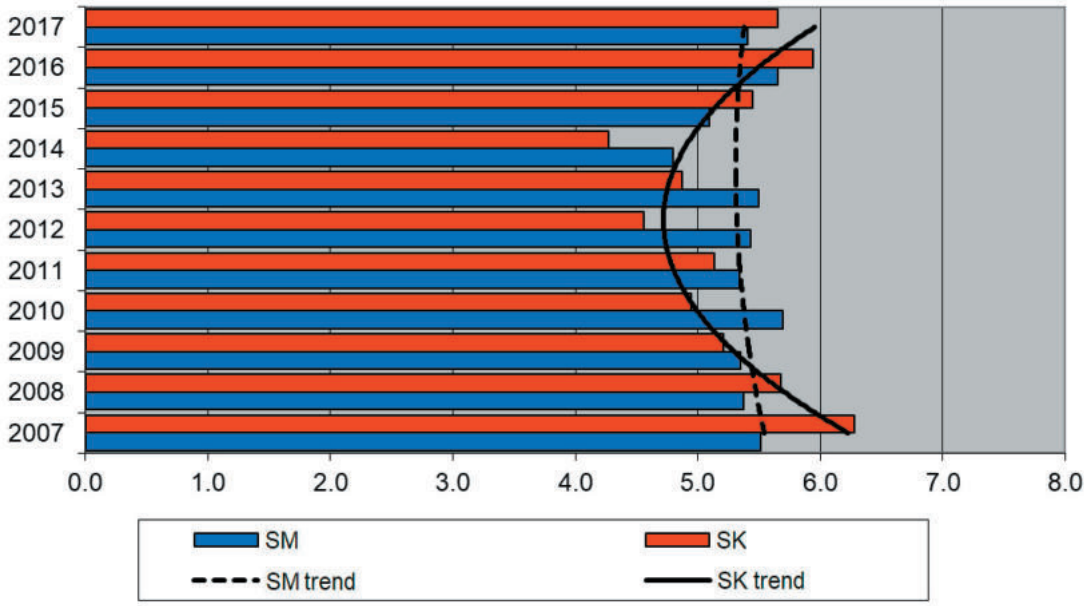

Fig. 9. Candidate Strength (SK) and Motivation Strength (SM).

conversations dealing with the broadly defined condition of archaeology students. They are criticised for laziness, lack of passion, lack of commitment, opportunism, wasting the potential and finally for the "poor quality" of graduates. The opinions quoted are just a compilation, an averaging, of the voices heard. On the other hand, as our analysis shows, archaeology is taken up by young people with above average talent, characterised by significant motivation to study this subject. One might ask: why is there such a dissonance between opinions (or perhaps facts?) about students and facts about candidates (Dejna and Nalaskowski 2013b)?

It seems that it may be a change in young people's attitudes to archaeology, and to studying more broadly that is occurring during the course of their studies. What is responsible for this? It is difficult to tackle this serious problem in such a short text, so we are left with careful speculation. It may be a disappointment with the course itself, the practice of which is different from what was originally imagined. Perhaps the study programme turns out to be moderately entertaining. Maybe it is finally the lack of developmental stimuli and requirements that enables young people to fall into unsatisfactory averageness? It is certainly worth further analysis in this field in order to reach clear conclusions.

At this point it is worth returning for a moment to the point made at the beginning of this text about the broad sociological context and conditions for undertaking humanities. As our research shows, the group of those willing to study archaeology is steadily decreasing, their 'quality' leaves much to be desired, and the frustration of lecturers and course managers is growing. After something of a "boom" in studying archaeology, which could be attributed to the policy of Leszek. Miller, consisting in enabling almost all willing secondary school graduates to have access to universities (one of the motives was an attempt to reduce unemployment among secondary school graduates and an attempt to "catch up" with Western countries in terms of the percentage of people with higher education in society), a period of stagnation came. The "Boom" passed, giving way to the phenomenon of pragmatisation of young people's awareness. The phenomenon of pragmatisation of consciousness, in the context of the presented reflections, consists in perceiving social reality through the prism of benefits, and goals set for oneself through the prism of competition with peers. This tendency is visible in the reduction of the goals set mainly to one's own material situation in life (Bardziejewska, Brzezińska and Hejmanowski 2004).

Today's secondary school graduates and students are extremely practically oriented towards life. Exposed to the aforementioned social campaigns aimed at discouraging the study of the humanities, regularly exposed to content and media messages promoting material success in life, raised by overworked parents and grandparents who are still very active professionally – they experience a pragmatisation of consciousness which is responsible for their educational decisions.

Young people expect direct gratification for their educational efforts. Their efforts are to be crowned with achievement of a high social and professional position and the resulting benefits (Ziółkowski 1995, 8–15). This phenomenon can be illustrated by a dichotomy taken from Erich Fromm (1995). Being educated (i.e. treating education as a value in itself) replaced having an education (i.e. treating education as an instrument through which one acquires specific skills and qualifications needed to occupy a desired position in the social structure). This phenomenon is related to the process which is referred to as commodification (Wasilewski 2001) of education. Looking from the perspective of an individual it consists in treating education as an investment for the future and a diploma as a market good (Wasilewski 2006, 124). Perhaps the issues signalled here are the source of recruitment problems not only for archaeology in Toruń, but for archaeology in general. This is just a contribution to further research and discussion.

7. Conclusion

In the context of the analyses and conclusions presented above, an important and interesting issue would be to question the legitimacy of introducing or reinstating entrance exams for archaeological studies. Supporters of such a solution argue that it would give the possibility to select candidates, which could easily result in the quality of students. Therefore, let us follow this mechanism. Certainly, two-stage entrance exams are the most selective form of recruitment. At the first stage the candidates' knowledge in selected areas is checked, at the second stage – an interview – it is additionally possible to get to know their motivations, other interests. Less selective is of course the form with the exam itself, then the interview itself. In the first case, only formal knowledge is taken into account, while in the second usually a slightly less formal process, also unmeasurable, with more subjective factors. Another mechanism is the certificate competition. According to its assumptions, in the case of archaeology, there is no possibility of verifying field knowledge, the evaluation

is based solely on the results obtained in the matura examination, mainly in school subjects, which do not include archaeology. A pre-set number of candidates with the highest ranking score are admitted through a certificate competition. The next strategy is the admissions based on a points criterion (a combination with a certificate competition is possible here), those candidates are admitted (possibly all) who, after recalculation of the matura results, have reached a minimum, previously set, points criterion.

In the last years of recruitment to archaeology in Toruń, only the strategy of a certificate competition was used. The reason seems to be clear – the very small number of candidates. Considering the limits set by the authorities for candidates for the course (60–40–30) the number of actual applicants was, as has been shown, far lower. In practice, absolutely all candidates were admitted to archaeology, provided they had a secondary education. The actions and motivation of the authorities also seem to be justified by the desire to ensure continuity of the course. The management practice at the Nicolaus Copernicus University points to the closure of courses where there are no candidates (environmental protection, sculpture, Baltic studies, European studies). Any form of selection (exams, interviews, point criterion) would, by definition, serve to reduce the already low number of applicants, which would result in the closure of the course. It seems that in recent years there was no practical possibility of any deeper verification of students' intake and in practice it turned out that the list of candidates for studies with the first priority of archaeology was the same as the list of those accepted.

Archaeology is undoubtedly a niche field of study in Toruń, as well as in Poland. Its specificity is created by the candidates for students, the students themselves, the atmosphere of the faculty, the infrastructure and the lecturers. However, only by extending the analyses according to the presented scheme, which we are planning to do, with the characteristics of the candidates for other courses, we would be able to gain a full insight into the recruitment situation at the University and the condition of particular courses. In the face of dynamic changes which are currently affecting Polish higher education institutions, such a research perspective seems tempting. Because research on the profiles of candidates for various university courses, located at the border between general education and higher education, may be a source of interesting and useful explanations and hypotheses.

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Field Research in the Targowisko Region in 2018–2019

Abstract

Golański A., Kadrow S., Krzywda A. 2021. Field Research in the Targowisko Region in 2018–2019. *Analecta Archaeologica Ressoviensia* 16, 19–41

The article presents the results of test excavations at three sites in the early Neolithic settlement region of Targowisko, carried out in 2018–2019. The goal of these investigations was the detection of fragments of Neolithic settlement zones where only one building phase has survived. It was decided to perform this task using a magnetometer as part of a slightly wider program of geomagnetic prospection. The second goal was to acquire sets of arti- and ecofacts related to the shortest possible period of time, i.e. equal to the existence of one family living in one house, representing one cultural tradition. The third goal was to explain the generators and mechanisms of early Neolithic cultural transformation from a micro-regional perspective.

Keywords: LBK, early Neolithic, Małopolska, Malice culture, transformation, dwellings, Targowisko region

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Introduction

In the years 2002–2007, on the route of the A-4 motorway through the fields of the village of Targowisko, district Wieliczka (approx. 30 km east of Kraków) and neighboring villages, large-scale rescue excavations were carried out and which brought significant archaeological discoveries. One of the most interesting discoveries was the unveiling of vast fragments of a settlement complex from the early Neolithic age (i.a. Czerniak 2013; Czekaj-Zastawny 2014; Zastawny (ed.) 2014; Kadrow 2018; Kadrow *et al.* 2020; 2021; Forysiak *et al.* 2021).

This settlement complex (Fig. 1) is located between the Vistula and Raba rivers (the so-called "Targowisko" region – cf. Czerniak 2013; Kadrow *et al.* 2021 or "Brzezie" region, cf. Czekaj-Zastawny 2017, fig. 12). In the zone described above, traces of *Linienbandkeramik* (hereafter: LBK) settlement from the oldest (I) to the youngest (III) phases have been documented (cf. Czerniak *et al.* 2006; Włodarczak 2006; Kadrow and Okoński 2008; Czerniak 2013; Zastawny and Grabowska 2014; Kadrow *et al.* 2020). Moreover, relics of the early and classical Malice culture (hereafter: MC) phases have been discovered there (Czekaj-Zastawny *et al.* 2002; 2007; Czerniak *et al.* 2007; Grabowska and Zastawny 2014; Kadrow *et al.* 2020).

In 2018–2019, test excavations were carried out on three selected sites from this region, the purpose of which was to achieve several goals. One of them was the detection of such fragments of Neolithic settlement zones where only one building phase has survived. It was decided to perform this task using a magnetometer as part of a slightly wider program of geomagnetic prospection (cf. Golański *et al.* 2019).

The second goal, closely related to the first, was to acquire sets of arti- and ecofacts related to the shortest possible period of time, i.e. equal to the existence

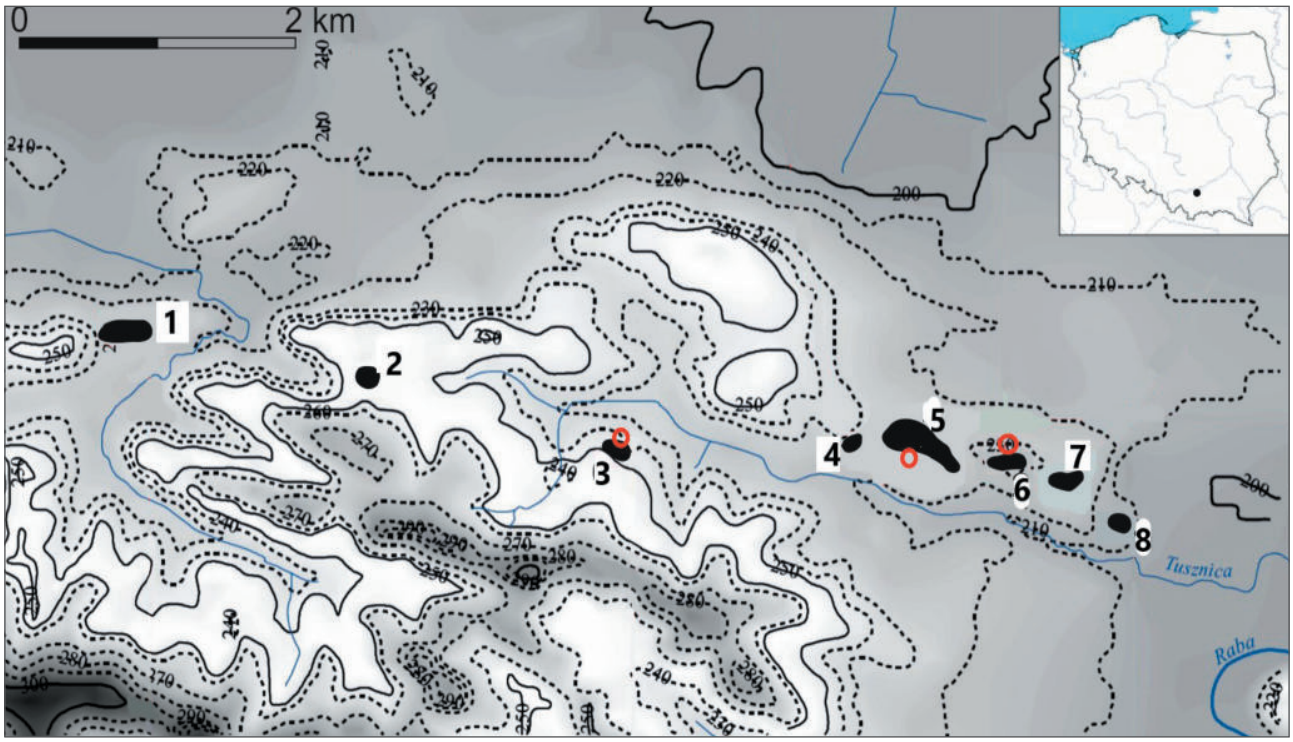

Fig. 1. Targowisko settlement region. Early Neolithic (LBK and MC) sites with relics of houses: 1 – Zagórze 2, 2 – Brzezie 17, 3 – Brzezie 40, 4 – Szarów 9, 5 – Targowisko 16, 6 – Targowisko 14–15, 7 – Targowisko 12–13, 8 – Targowisko 10–11; test excavations made in 2018–2019 on sites marked with red circles.

of one family living in one house, representing one cultural tradition, with no mix of older or younger archaeological material. Due to the multi-phase nature of the Neolithic settlement in the Wieliczka-Bochnia loess zone, this task is neither easy nor obvious. A valuable hint in this regard was the observation of Ryszard Grygiel that the traces of single-phase settlement (house 56 in Brześć Kujawski, site 4) can only be discovered on the edges of settlements inhabited for longer periods (Grygiel 1986, 273, ryc. 3).

These types of single-phase and peripherally situated remains of houses, being reference points for the interpretation of chronologically mixed groups of monuments, allow for a more in-depth reconstruction of the microprocesses of the development of settlement infrastructures on long-term inhabited sites. Ultimately, they are intended to help achieve the third goal, i.e. to explain the generators and mechanisms of early Neolithic cultural transformation from a micro-regional perspective, in line with the main goal of the NCN project 2016/21/B/HS3/03137 (*Great culture transformation in microregional perspective. Trends of changes inside Danubian farmers – interdisciplinary study*).

Field research on selected sites

As a result of a field survey conducted in 2017 by Martin Posselt (company: Posselt & Zickgraf – Archäologisch-geophysikalische Prospektionen GbR from Germany), relics of three houses at three sites were selected for excavation tests: Brzezie 40 (LBK), Targowisko 16 (LBK) i Targowisko 14–15 (MC) (cf. Golański *et al.* 2019, 9–15).

In 2018, the team of the Łódzka Fundacja Badań Naukowych, led by Adam Golański, conducted excavation tests of the LBK dwelling structures (Fig. 2). It was decided to explore the long house from the northern ends of site 40 in Brzezie and the post-hole house from site 16 in Targowisko. These objects met the condition of being located on the edge of the settlements, representing single-phase (in both cases the beginning of the Želiezovce phase) of settlement.

In 2019, the remains of the MC house were identified at sites 14–15 in Targowisko (Fig. 2). It met similar expectations as the relics of the LBK houses described above. In each of the three mentioned cases, an area of 10 ares was investigated. The size of the excavation units was sufficient to reveal the available parts of the

Fig. 2. Targowisko settlement region. Map of geomagnetic survey divided into target areas (red) with location of excavated houses (blue circles) (prepared by M. Posselt; cf. Golański *et al.* 2019).

examined houses and their immediate surroundings in order to exclude the presence of traces of settlement from other building phases.

Brzezie site 40

At the northern edge of site 40 in Brzezie, geomagnetic prospecting revealed the relics of one long LBK house, clearly separated from other traces of building structures (Fig. 3; cf. Golański *et al.* 2019, fig. 12–15). In an excavation unit with an area of one are, the remains of long building pits (Fig. 4) with no traces of post-holes have been discovered (Fig. 5, 6). Their absence is not caused by the destructive effect of post-depositional processes. Rather, it is a construction peculiarity of this house (cf. Czerniak 2019, fig. 2).

In pits near the house and in so-called cultural layer, 604 pieces of LBK pottery were discovered. The vast majority of these were very small sherds. Only 15% of them represent characteristic fragments, i.e. ornamented ones or being parts of the upper rims or bottoms. The ceramics are divided into delicate vessels, ornamented by incised lines (Fig. 7: 2, 4–8, 10, 11, 13; 8: 1–6, 10, 12, 14) and kitchen ones, composed of hemispherical bowls and vessels with a neck, decorated with plastic elements and fingernails imprints (Fig. 7: 1, 3, 9, 12; 8: 7–9, 11). The presence of notches crossing the incised lines (Fig. 7: 8, 11; 8: 3) allows to date this set of pottery to the beginning of the Želiezovce (III) phase (Kadrow 1990, 72–73, fig. 28; 2020, fig. 7). A characteristic feature of this set of remains is the relatively high proportion of parallel, closely spaced incised lines in the ornamentation (Fig. 7: 5, 11, 13; 8: 1, 2, 4, 10, 12, 14).

Targowisko site 16

On the western edge of site 16 in Targowisko, thanks to the geomagnetic prospection, traces of three long LBK houses, located at fairly large distances from each other, were recorded (Golański *et al.* 2019, fig. 4–7). It was decided to excavate the northernmost house (Fig. 9).

A house consisting of 5 rows of post-holes was unveiled (Fig. 10, 11). Long pits have been explored on both sides of the house (Fig. 12, 13).

In domestic pits and in the so-called cultural layer, 618 pieces of LBK pottery were discovered, mostly of small size. Only 14% of the pottery sherds represent the category of characteristic ceramics, i.e. they have an ornament or are part of the rim or a bottom.

Among the delicate ceramics, vessels decorated with incised lines (Fig. 14: 6–8, 10, 12–14, 16; 15: 2, 5, 6, 10, 12, 14, 17, 18, 20) which are sometimes cut with notches, predominate (Fig. 14: 2, 4, 5, 9, 18, 20; 15: 1, 11, 13, 16). Kitchen ceramics, including hemispheri-

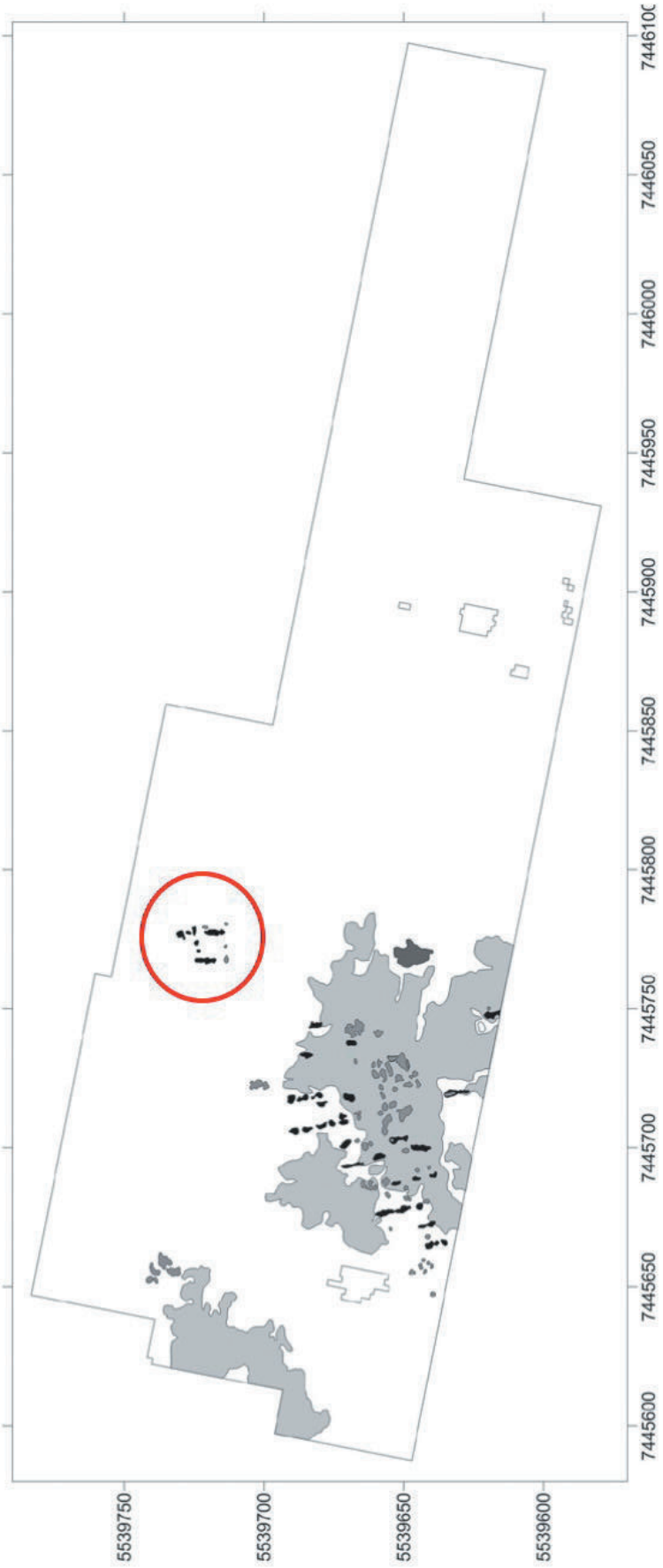

Fig. 3. Brzezie site 40. Location of LBK dwelling structure chosen for test excavations marked with a red circle on the background of the results of geomagnetic prospection (according to Golański *et al.* 2019).

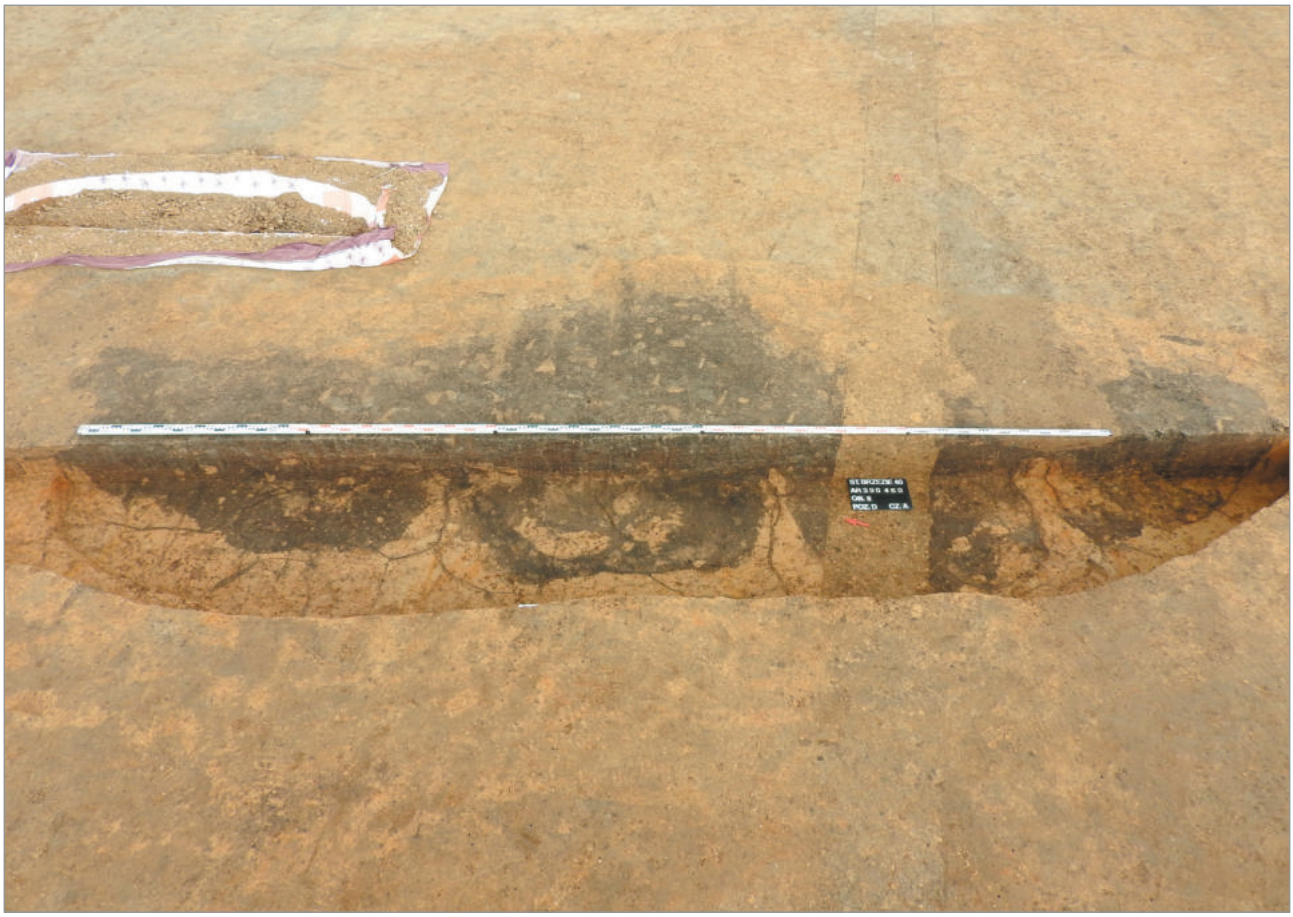

Fig. 4. Brzezie site 40. Profile of the long pit (feature 8) along the E wall of the LBK house (drawn by M. Golańska).

Fig. 5. Brzezie site 40. Relics of the house with features (objects) numbering. Surface cut with diagonally running modern grooves (drawn by. M. Golańska).

Fig. 6. Brzezie site 40. Spatial arrangement of the objects that are the remains of the LBK house (photo by A. Golański).

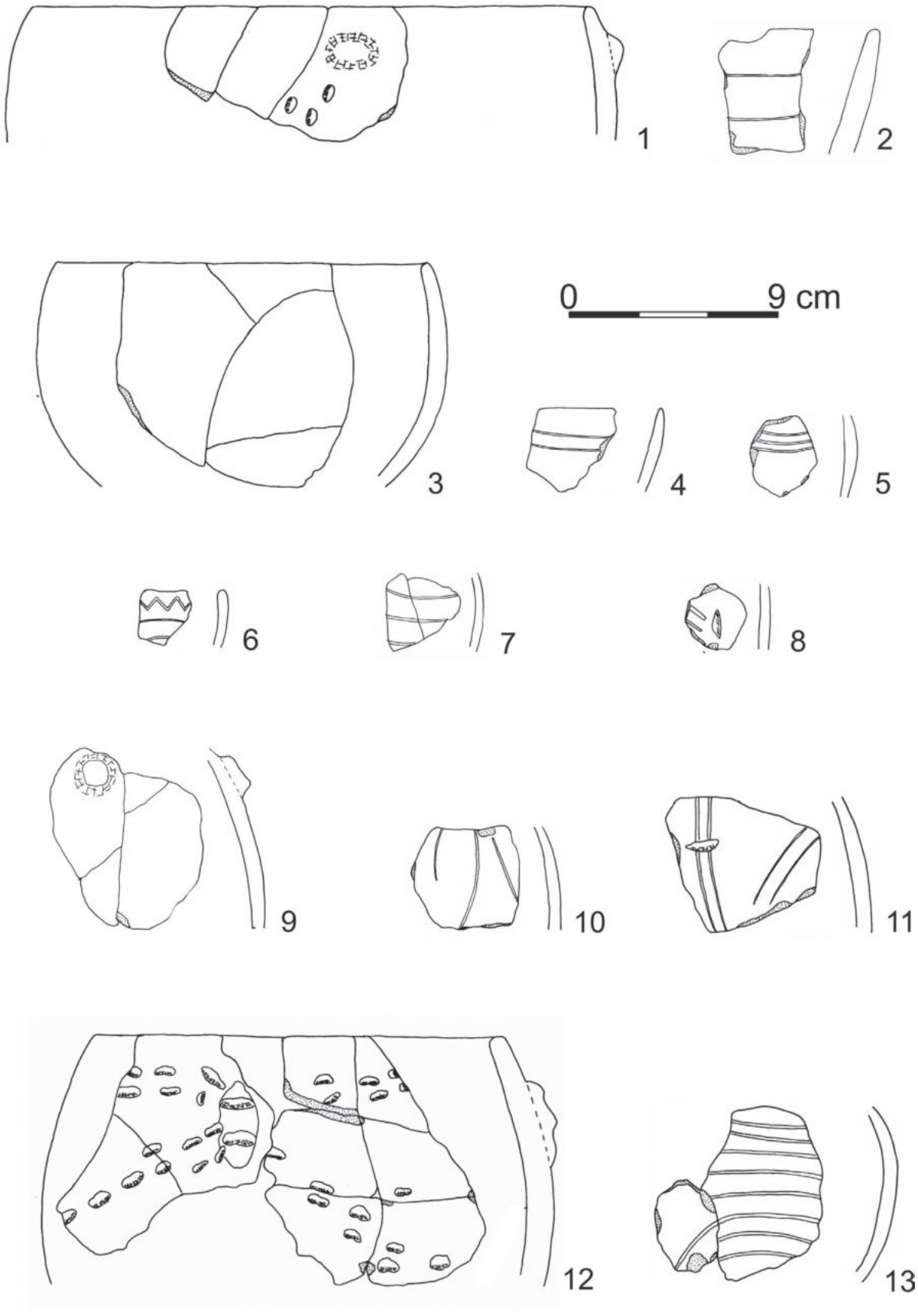

Fig. 7. Brzezie site 40. Selection of LBK pottery from the excavated house (drawn by M. Golańska and A. Krzywda).

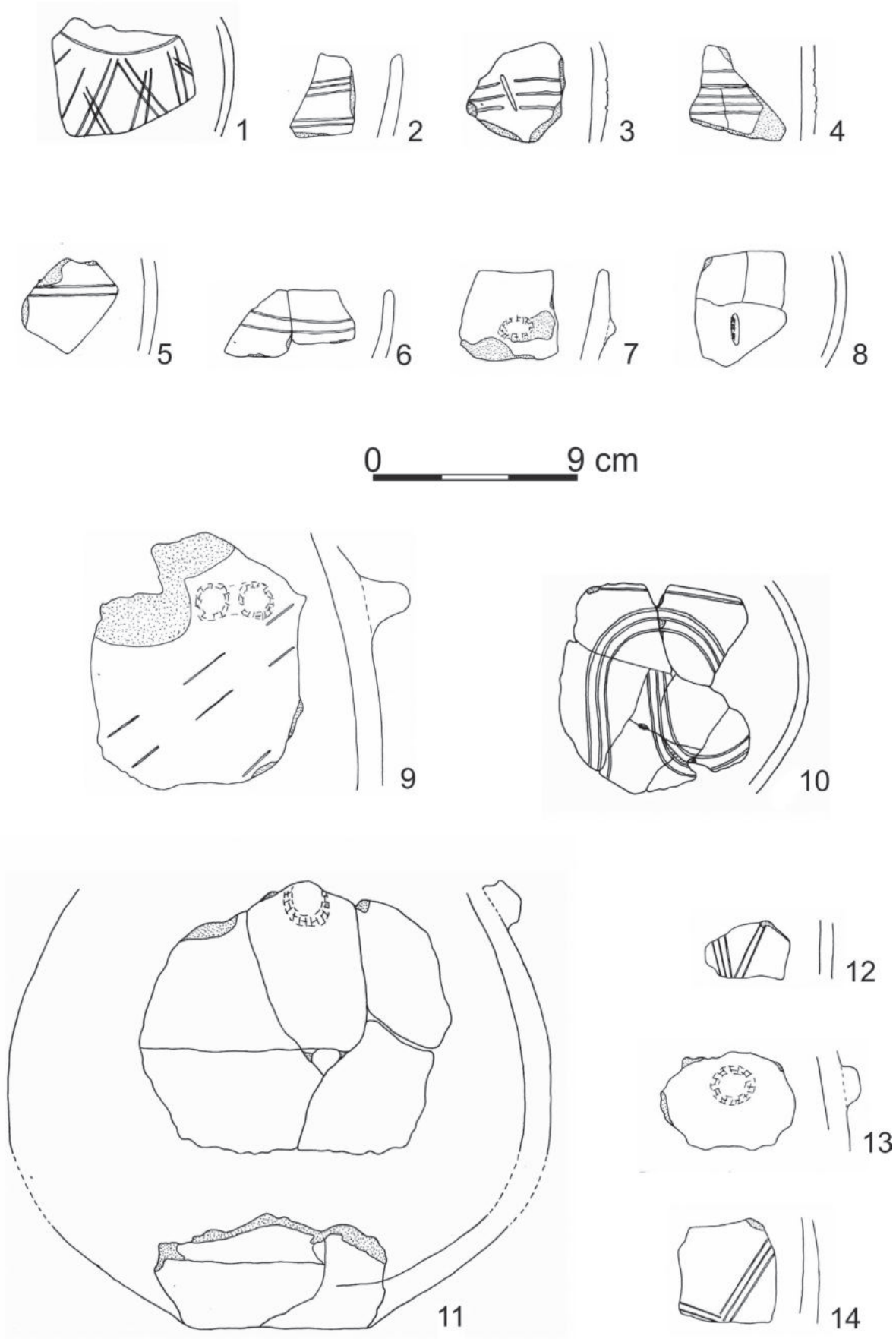

Fig. 8. Brzezie site 40. Selection of LBK pottery from the excavated house (drawn by M. Golańska and A. Krzywda).

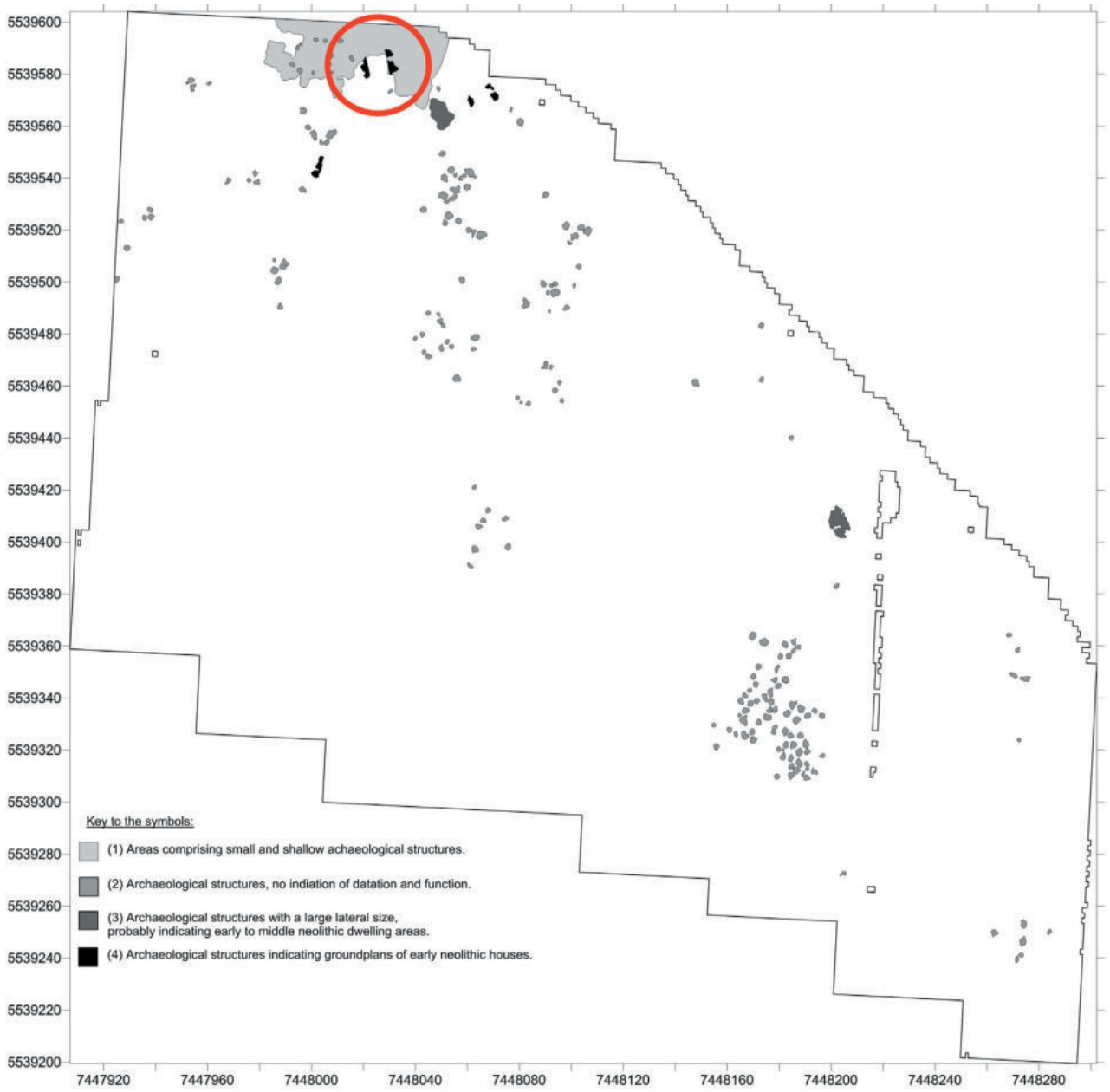

Fig. 9. Targowisko site 16. Location of LBK dwelling structure chosen for test excavations marked with red circle on the background of the results of geomagnetic prospection (according to Golański *et al.* 2019).

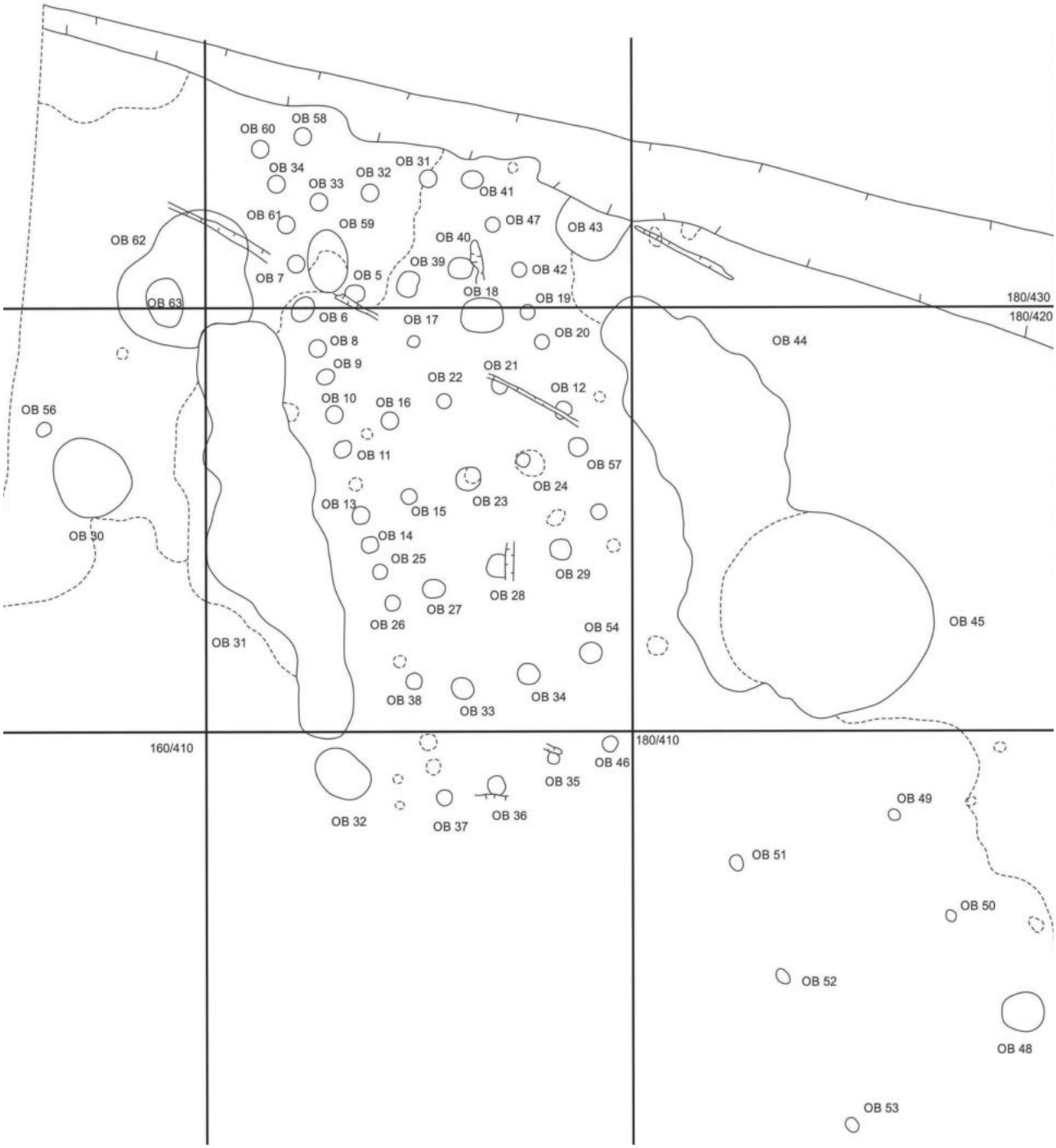

Fig. 10. Targowisko site 16. Spatial arrangement of the numbered features (objects) that are the remains of the LBK house (drawn by. M. Golańska).

Fig. 11. Targowisko site 16. Spatial arrangement of the objects that are the remains of the LBK house (photo by A. Golański).

Fig. 12. Targowisko site 16. Profile of the long pit (object 31) along the W wall of the LBK house (photo by A. Golański).

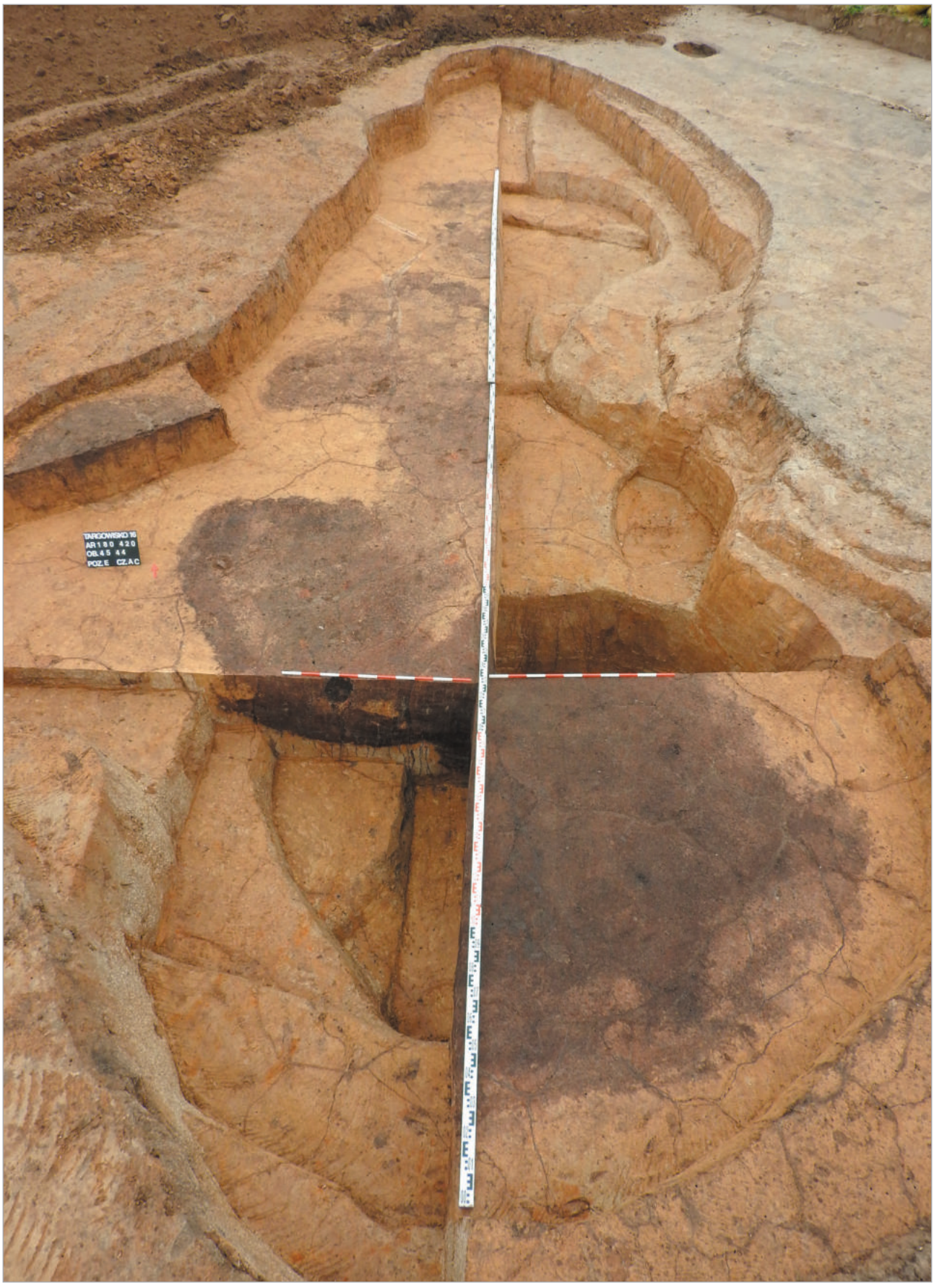

Fig. 13. Targowisko site 16. Profile of the pits (objects 44 and 45) along the E wall of the LBK house (photo by A. Golański).

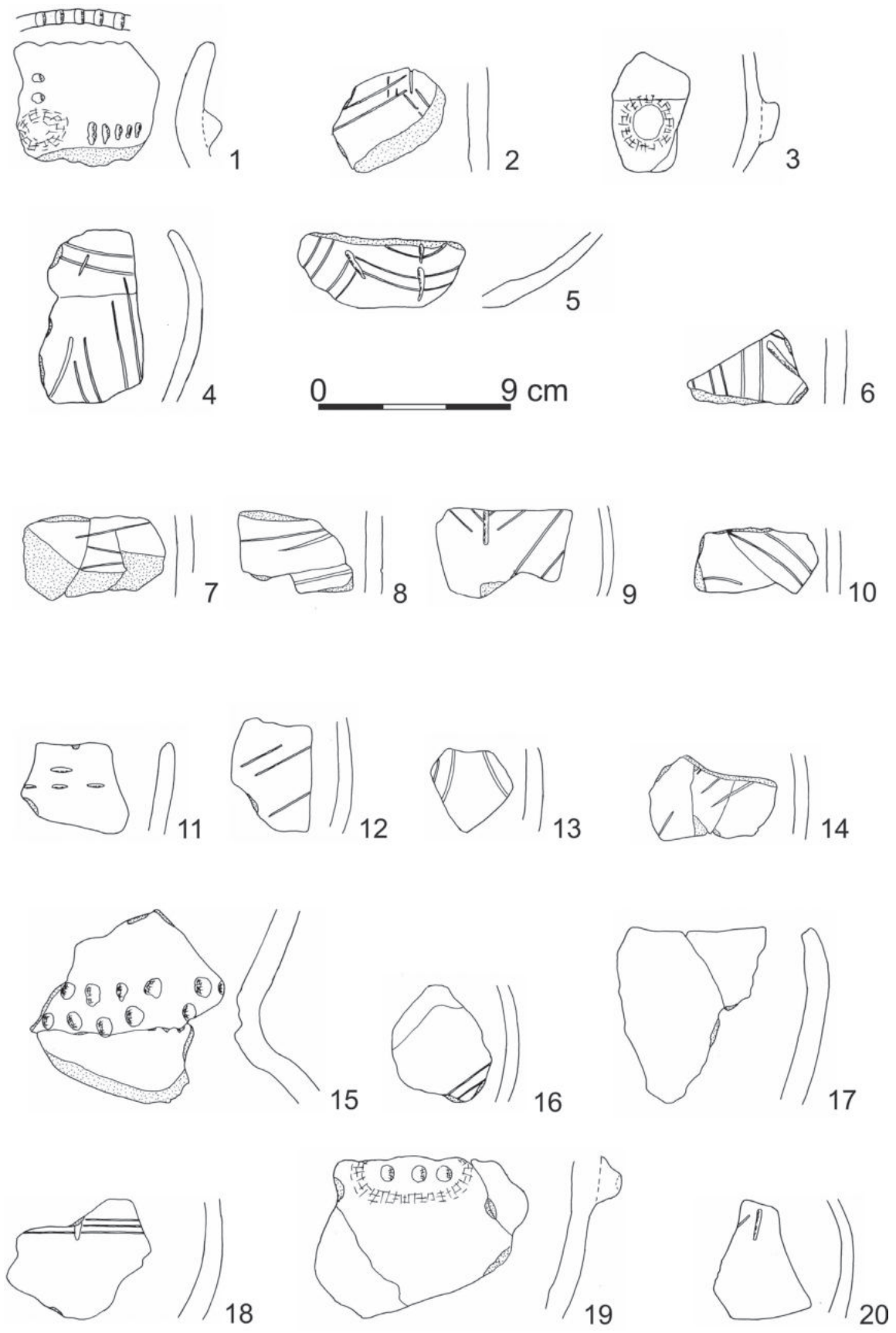

Fig. 14. Targowisko site 16. Selection of LBK pottery from the excavated house (drawn by M. Golańska and A. Krzywda).

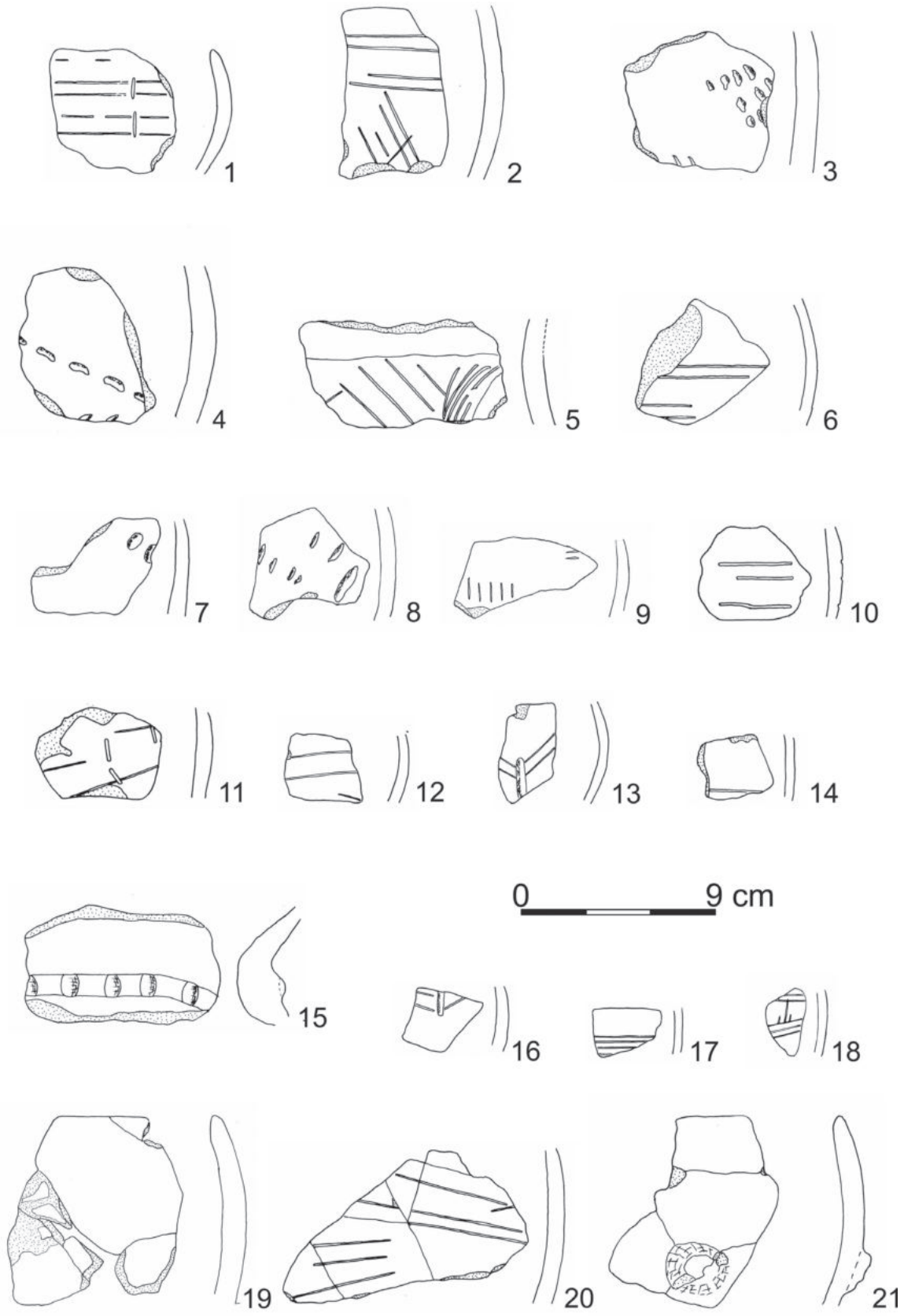

Fig. 15. Targowisko site 16. Selection of LBK pottery from the excavated house (drawn by M. Golańska and A. Krzywda).

cal and necked dishes, are decorated with plastic ornaments and fingerprints (Fig. 14: 1, 3, 11, 15, 17, 19; 15: 3, 4, 7, 8, 15, 19, 21). The large share of notches in incised ornamentation suggests a slightly younger position in the Želiezovce (III) phase (Kadrow 2020, fig. 7) than the pottery set from Brzezie 40.

Targowisko site 14–15

In the northern part of site 14–15 in Targowisko, traces of five MC houses were registered thanks to geomagnetic prospection (Fig. 16; cf. Golański *et al.* 2019, fig. 8–11). One of these houses was selected for excavation work (see Golański *et al.* 2019, fig. 11). Relics of a 12 m long MC house, typical for western Małopolska (Fig. 17, 18), consisting of a single row of post-holes on the perimeter of a rectangular structure and one row of post-holes separating the vestibule were discovered (see Kadrow 2015, fig. 2–4). From the north-west it is accompanied by a construction (clay) pit (Fig. 17, 18).

A total of 653 fragments of MC ceramics were discovered, of which only 92 characteristic sherds (14%). There are pear-shaped vessels decorated with a stroked ornament in the form of horizontal lines below the rim and sliding triangles on the upper part of the belly (Fig. 19: 5, 17; 20: 16), small cups (Fig. 19: 14), bowls (Fig. 20: 2), bowls on hollow pedestals (Fig. 20: 17), other vessels on feet (Fig. 20: 9), amphorae with anthropomorphic image (Fig. 20: 10; cf. Grabowska and Zastawny 2007, fig. 4–5), baggy vessels (Fig. 19: 15; 20: 6) and large biconical vessels. Kitchen pottery, ornamented with knobs, plastic lines and various imprints and incisions dominate over delicate one ornamented with strokes. The forms of these vessels and their ornamentation are typical for the classic MC phase (Kadrow 2006, 63–69).

Summary

The collection of flint artifacts and plant macroremains from above described dwellings structures are published in separate articles in this volume (respectively Wąs 2021 and Abramów 2021).

It was possible to achieve all the intended research goals, albeit to a different extent. The first two objectives were fully achieved, i.e. the detection of fragments of Neolithic settlement zones where only one building phase has survived, with this confirmed by the results of test excavations. On each test site, relics of the remains of houses from one building phase were discovered, which is evident in the light of the ceramics obtained and the radiocarbon dates (Fig. 7, 8, 14, 15, 19–21; Tab. 1). The second goal was also achieved. Sets of arti- and ecofacts related to the shortest possible period of time, i.e. equal to the existence of one family living in one house, representing one cultural tradition, with no mix of older or younger archaeological material were acquired (cf. Abramów 2021; Kadrow *et al.* 2021; Wąs 2021).

The accomplishment of the first two objectives mentioned above has significantly contributed to the achievement of the third goal (to explain the generators and mechanisms of early Neolithic cultural transformation from a micro-regional perspective). It turned out that the above mentioned transformation in the Targowisko region was of a more complex nature than previously thought. The heterogenic nature of MC has been confirmed, as was the profound demographic crisis at the turn of the LBK and the MC.

In addition to the results of the excavations described above, a series of radiocarbon dates were also obtained, precisely defining the absolute age of the beginning of the late (III) LBK phase and the classic (Ib) MC phase (Fig. 21; Tab. 1). As samples for age determination, macroremains of plants collected from the bottom parts of construction pits accompanying the excavated houses at the sites of Brzezie 40 and Targowisko 14–15 and 16 were used (Abramów 2021). At the same time, the assumption about the single phase nature of the explored parts of the sites and the origin of all arti- and ecofacts obtained from there from narrow time intervals was confirmed.

Thanks to the acquisition of a series of radiocarbon dates from the archaeological context (Fig. 21; Tab. 1) and the TRG core of biogenic sediments (Forysiak *et al*. 2021, fig. 4, tab. 1), it was possible to determine the sequence of settlement of the region Targowisko: LBK phase I–II – 5300–5100 BC; LBK III – 5100–5000 BC; MC Ia – 4950–4800 BC; MC Ib – 4650–4550 BC.

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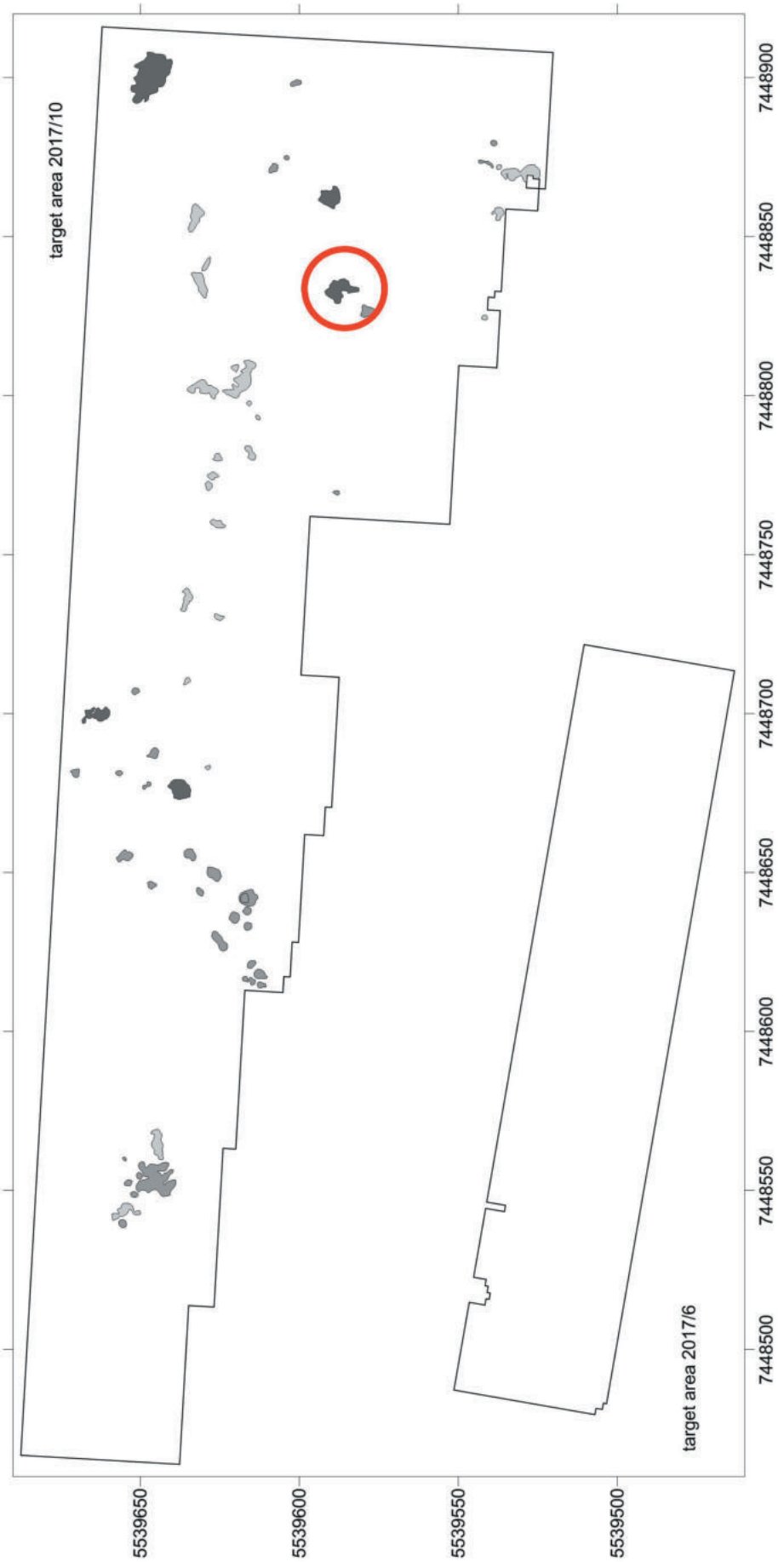

Fig. 16. Targowisko site 14–15. Location of MC dwelling structure chosen for test excavations marked with a red circle on the background of the results of geomagnetic prospection (according to Golański *et al.* 2019).

Fig. 17. Targowisko site 14–15. Spatial arrangement of the objects that are the remains of the MC house (photo by A. Golański).

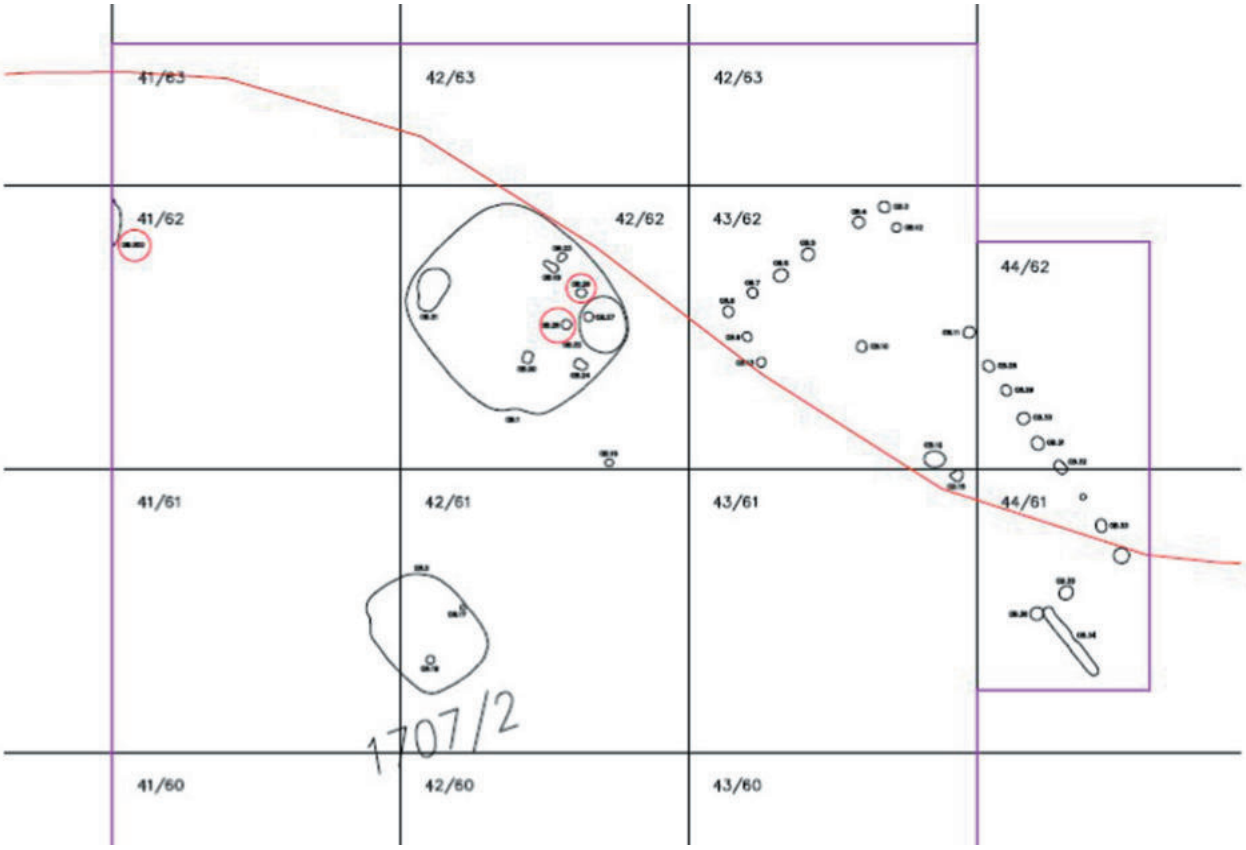

Fig. 18. Targowisko site 14–15. Spatial arrangement of the numbered features (objects) that are the remains of the MC house (drawn by. M. Golańska).

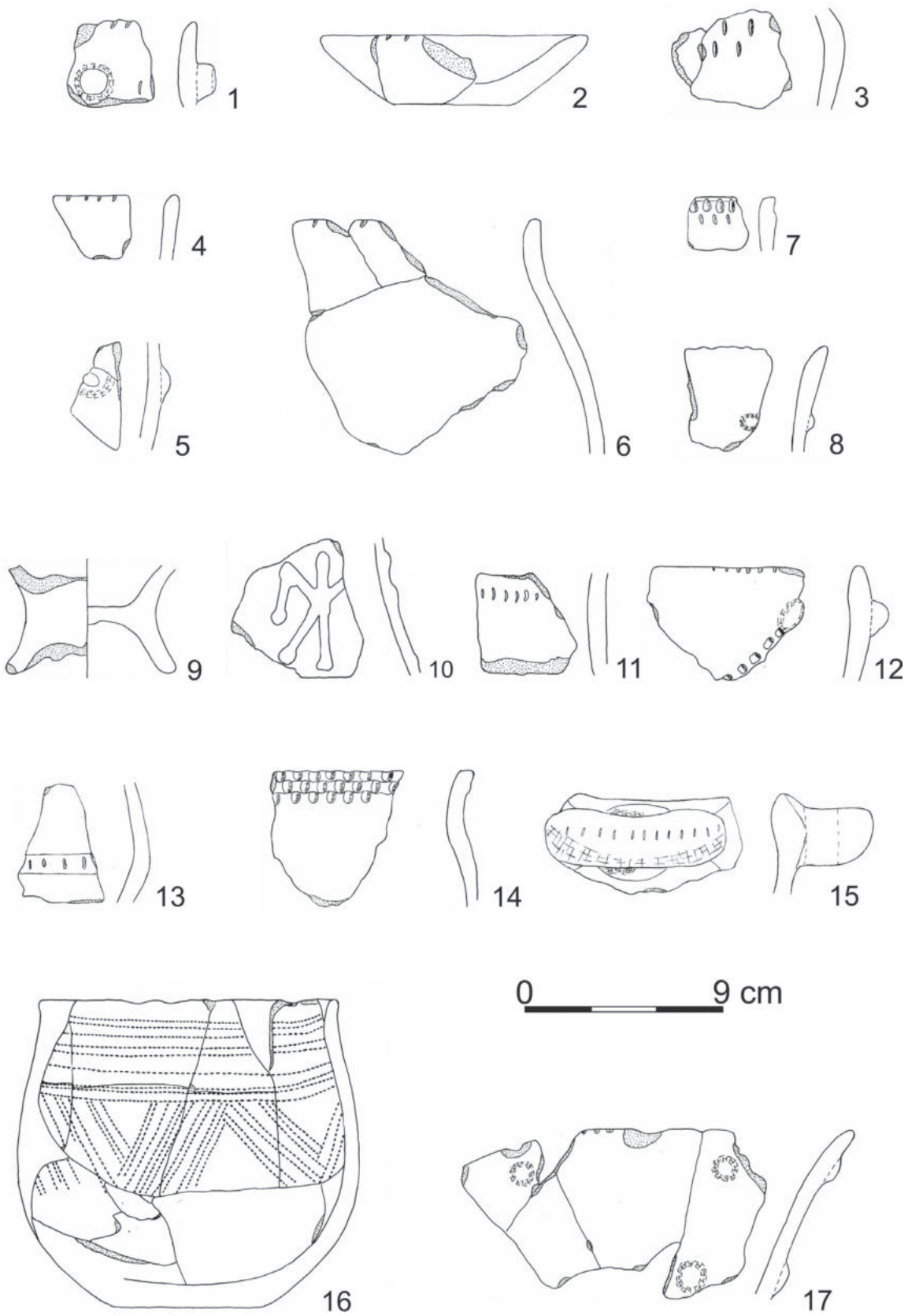

Fig. 19. Targowisko site 14–15. Selection of MC pottery from the excavated house (drawn by M. Golańska and A. Krzywda).

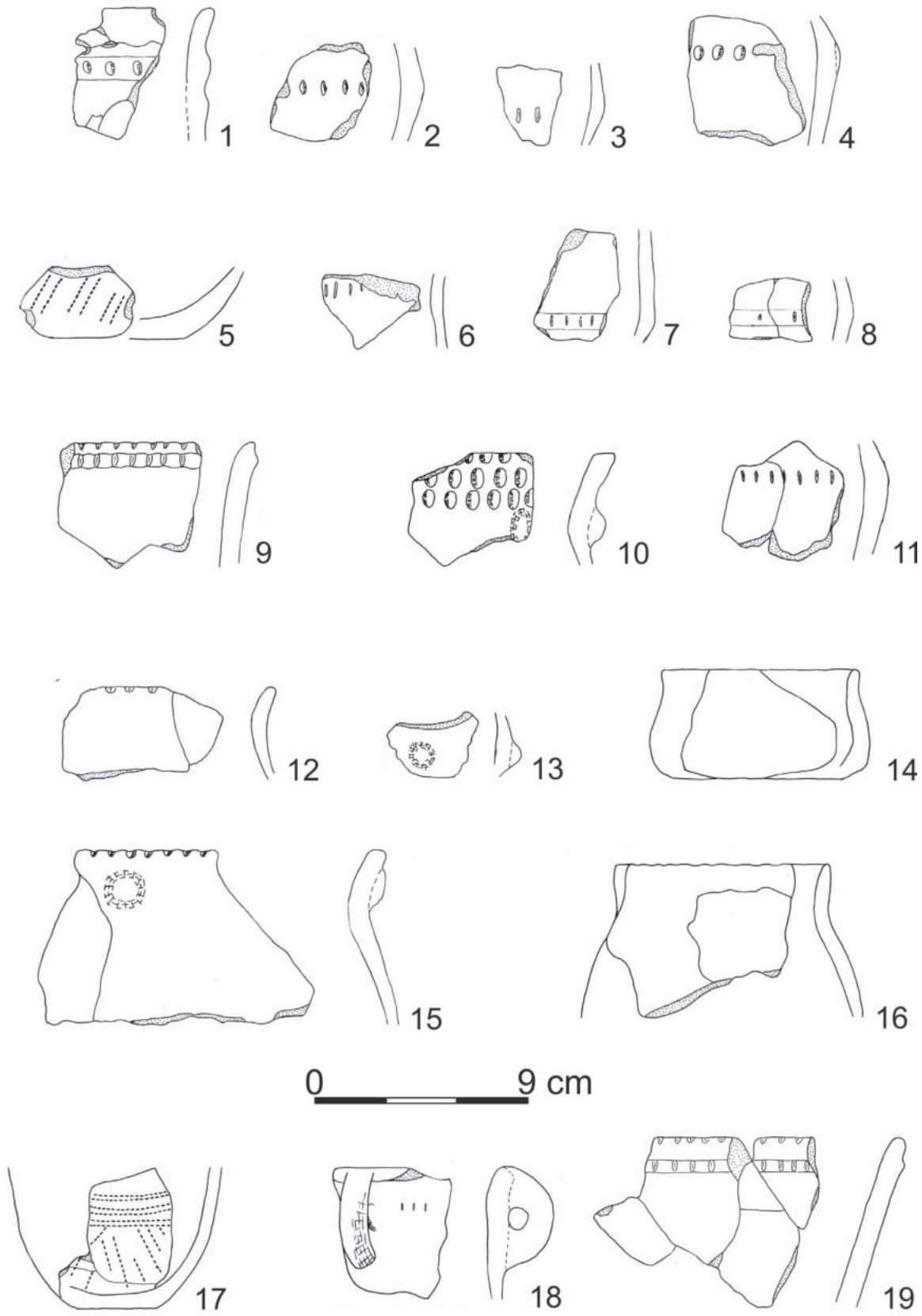

Fig. 20. Targowisko site 14–15. Selection of MC pottery from the excavated house (drawn by M. Golańska and A. Krzywda).

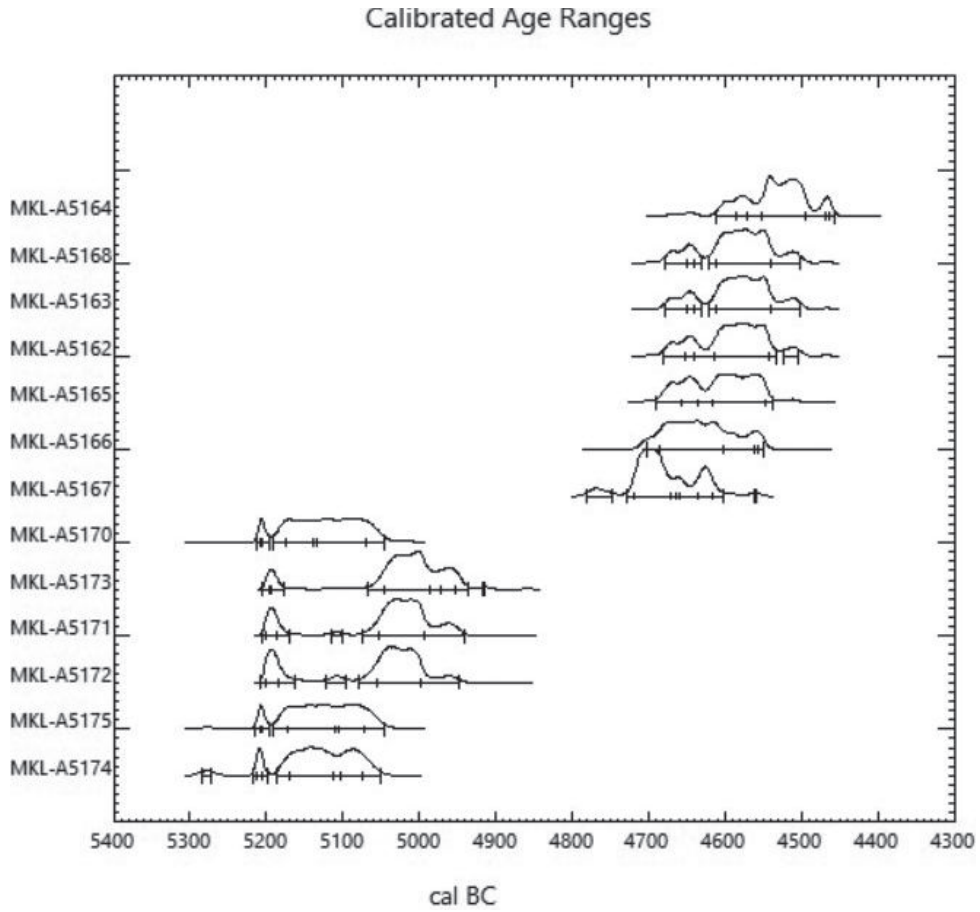

Fig. 21. Radiocarbon chronology of LBK (Brzezie 40 and Targowisko 16) and MC (Targowisko 14–15) houses (calibration after Calib Rev 8.1.0) (according to Kadrow *et al.* 2021).

Table 1. List of radiocarbon dates from LBK settlements at Brzezie site 40 and Targowisko site 16 and from MC settlement at Targowisko site 14–15. Calibration after Calib Rev 8.1.0 (according to Kadrow *et al.* 2021).

L.p.	Site	Lab	BP	BC – 68.3% probability	BC – 95.4% probability
1	2	3	4	5	6
1	Targowisko 14–15, ob. 10	MKL-A5164	5705±24	4585 (8.9%) 4569 4553 (56.6%) 4493 4469 (2.7%) 4464	4611 (95.4%) 4456
2	Targowisko 14–15, ob. 1	MKL-A5168	5737±23	4650 (4.7%) 4641 4613 (63.6%) 4540	4678 (18.0%) 4631 4621 (77.5%) 4501
3	Targowisko 14–15, ob. 1c	MKL-A5163	5737±23	4650 (4.7%) 4641 4613 (63.6%) 4540	4678 (18.0%) 4631 4621 (77.5%) 4501
4	Targowisko 14–15, ob. 1	MKL-A5162	5741±23	4652 (6.5%) 4640 4613 (61.8%) 4542	4681 (90.2%) 4531 4526 (5.2%) 4502
5	Targowisko 14–15, ob. 1	MKL-A5165	5755±23	4658 (15.0%) 4636 4616 (53.3%) 4548	4691 (95.4%) 4536
6	Targowisko 14–15, ob. 1A	MKL-A5166	5779±24	4686 (65.0%) 4602 4562 (3.3%) 4556	4703 (95.4%) 4549
7	Targowisko 14–15, ob. 1	MKL-A5167	5821±23	4604 (57.0%) 4534 4520 (11.3%) 4504	4674 (7.6%) 4636 4616 (85.9%) 4492 4472 (1.9%) 4461

1	2	3	4	5	6
8	Targowisko 16, ob. 44b	MKL-A5170	6182±23	5176 (24.4%) 5140 5132 (43.9%) 5071	5214 (95.4%) 5046
9	Brzezie 40, ob. 7	MKL-A5173	6096±24	5197 (2.0%) 5193 5046 (55.5%) 4986 4971 (10.7) 4954	5206 (9.9%) 5176 5069 (85.3%) 4935 4917 (0.3%) 4913
10	Brzezie 40, ob. 10A	MKL-A5171	6108±24	5201 (11.1%) 5185 5054 (57.2%) 4992	5207 (16.2%) 5168 5116 (1.6%) 5100 5073 (77.6%) 4941
11	Brzezie 40, ob. 7	MKL-A5172	6118±23	5202 (14.5%) 5184 5056 (53.5%) 4998	5208 (21.9%) 5162 5121 (3.7%) 5096 5079 (69.8%) 4949
12	Brzezie 40, ob. 10A	MKL-A5175	6187±24	5173 (68.3%) 5073	5215 (95.4%) 5046
13	Brzezie 40, ob. 7	MKL-A5174	6200±23	5212 (4.1%) 5206 5171 (43.2%) 5114 5103 (21.0%) 5074	5283 (1.3%) 5274 5218 (8.5%) 5199 5187 (85.7%) 5051

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Early Neolithic Flint Assemblages from the Targowisko Settlement Region

Abstract

Wąs M., 2021. Early Neolithic Flint Assemblages from the Targowisko Settlement Region. *Analecta Archaeologica Ressoviensia* 16, 43–62

The article presents flint materials obtained from domestic facilities from the late phase of *Linienbandkeramik* from the Brzezie 40 and Targowisko 16 sites and the classic phase of the Malice culture from the 14–15 Targowisko site. These complexes contain relatively few monuments. Their advantage, however, is that they belong to chronologically compact groups. Since the relics of the discovered houses are spatially isolated from other settlement structures, it can be assumed that the set of flint artifacts belonging to them is relatively homogeneous. Thanks to this, they can contribute considerably to the discussion on the processes of cultural heterogenization and the origin of post-LBK cultures, including the Malice culture.

Keywords: LBK, Malice culture, flint industry, early Neolithic, Targowisko region, SE Poland

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Introduction

In the years 2002–2007, on the route of the A-4 motorway on the fields of the village of Targowisko, in the district of Wieliczka (approx. 30 km east of Kraków) and neighbouring villages, large-scale rescue excavations were carried out (cf. Golański *et al.* 2021 in this volume).

This settlement complex is located between the Vistula and Raba rivers (the so-called "Targowisko" region). In this zone traces of *Linienbandkeramik* (hereafter: LBK) settlement from the oldest (I) to the youngest (III) phases have been documented. Moreover, relics of the early and classical Malice culture (hereafter: MC) phases have been discovered there (cf. Golański *et al.* 2021, fig. 1).

In 2018–2019, test excavations were carried out on three selected sites from this region, the purpose of which was to achieve several goals (cf. Golański *et al.* 2019). As a result of a field survey conducted in 2017 by Martin Posselt, relics of three houses at three sites were selected for excavation tests: Brzezie 40 (LBK), Targowisko 16 (LBK) and Targowisko 14–15 (MC) (cf. Golański *et al.* 2019, 9–15; 2021).

Flint materials of *Linienbandkeramik* from the Brzezie site 40, Kłaj commune, Małopolskie voivodeship

1. Introductory remarks

During the excavation work carried out at the site of Brzezie 40, a collection of 122 flint artifacts was obtained.

The dispersion of flint materials indicates that they are related to the relics of the LBK settlement. Their structure is made up of the remains of one house, mainly in the form of parallel long pits located along its walls (Kadrow *et al.* 2021, fig. 3). Since the relics of the discovered house are spatially isolated from other settlement structures, it can be assumed that the set of flint artefacts belonging to them is relatively homogeneous, as a remnant of the smallest settlement unit

which is a household cluster (a dwelling with a yard), compact in space and time (Golański *et al.* 2019, 8).

Almost the entire flint inventory from the Brzezie 40 site comes from the fills of 11 features. In total, 109 specimens were found in them, and only 13 specimens come from the exploration layers outside the features. It is worth emphasizing that there are clearly noticeable quantitative differences between the flint collections from the facilities located on the western and eastern side of the house. Features located on the W from the house (mainly 10, 10A and 11) contained a total of 20 flint remains, while features 1, 7, 13 and 14 located on the E from the house contained as many as 78 flint artefacts.

2. Raw material structure

Almost the entire raw material structure of the flint inventory from Brzezie 40 is made of local Jurassic Cracovian flint (Tab. 1; Fig. 1). The share of this raw material is almost 82% of the total material (100 pieces). Thermal transformations make it impossible to identify the raw material for 17 specimens (approx. 14% of the collection). Despite the changes in colour, they have features that suggest that they are probably made of Jurassic Cracovian flint, which increases its percentage in the entire inventory. There are no registered remains of other types of flint. Moreover, 5 products made of obsidian were distinguished, which constitutes over 4% of the raw material structure of the entire inventory.

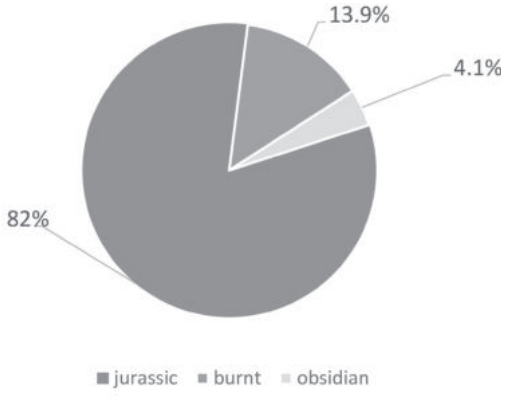

Fig. 1. Brzezie 40. Raw material frequency.

3. Technological and typological structure

The general structure of the inventory consists of products classified into 7 categories (Tab. 2; Fig. 2).

The most numerous group are products related to the flake exploitation (78 items in total). Flakes (64 items) and tools made on flakes (14 items, including one scraper) account for nearly 64% of the total inventory. The products associated with blade extraction (26 items) are slightly less numerous. The most numerous in this group are blades (10 pcs.). It also includes 1 rejuvenation flake probably from the exploitation of a blade core, and 15 tools made on blades. The rest of the inventory consists of specimens identified as chunks (9 items). Among them, 6 with negatives, 2 burnt and 1 natural specimen. A microdebitage in the form of 8 chips (smaller than 5 mm) was also identified.

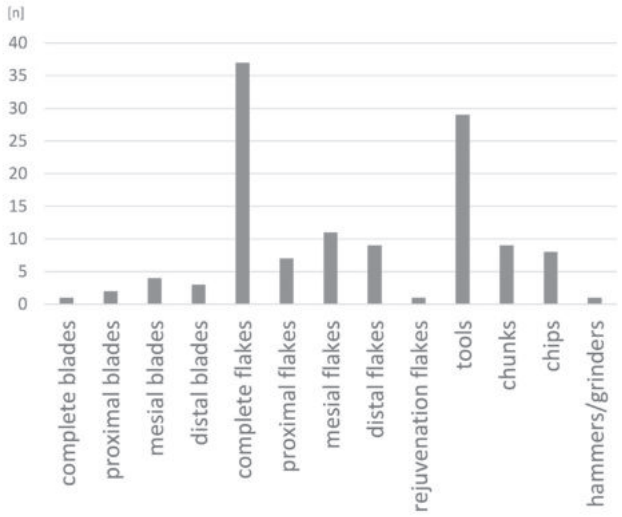

Fig. 2. Brzezie 40. Frequency of various types of flint products.

A tool group was also distinguished in the general structure of the flint inventory at Brzezie 40. A total of 29 tools (approx. 24% of the whole inventory) were identified and classified into 7 categories. Based on the degree of shape by retouching, two groups of tools can be distinguished. The first and most numerous group

Table 1. Brzezie 40. Raw material structure.

Raw material	Features											Outside features	=
	1	**2**	**4**	**6**	**7**	**8**	**10**	**10a**	**11**	**13**	**14**		
Jurassic Cracovian	25	1	4		38	1	5	6	5	4	1	10	**100**
burnt			5	1	4		1	2			3	1	**17**
obsidian			1		1		1					2	**5**
=	**25**	**1**	**10**	**1**	**43**	**1**	**7**	**8**	**5**	**4**	**4**	**13**	**122**

Table 2. Brzezie 40. Qualitative and quantitative structure of the flint inventory.

	Feature 1	Feature 2	Feature 4	Feature 6	Feature 7	Feature 8	Feature 10	Feature 10a	Feature 11	Feature 13	Feature 14	Outside features	SUM
BLADES			**2**		**6**		**1**					**1**	**10**
complete												1	1
proximal			1		1								2
mesial			1		3								4
distal					2		1						3
FLAKES	**18**		**5**	**1**	**21**		**4**	**6**		**2**	**4**	**3**	**64**
complete	11		2		11		2	5		1	3	2	37
proximal	2			1	4								7
mesial	2		1		3		1	1		1	1	1	11
distal	3		2		3		1						9
REJUVENATION FLAKES												**1**	**1**
TOOLS	**6**				**10**	**1**	**2**	**1**	**2**	**1**		**6**	**29**
end-scrapers					5		1	1		1			8
truncated blades	1						1						2
perforators					1								1
micro-retouched blades	2								1			1	4
blades with polish												1	1
retouched flakes	2				2				1			2	7
flakes with use retouch	1				2	1						2	6
CHUNKS		**1**	**1**		**1**			**1**	**2**	**1**		**2**	**9**
with negatives					1				2	1		2	6
burnt			1					1					2
natural		1											1
CHIPS	**1**		**2**		**4**				**1**				**8**
HAMMERS/ GRINDERS					**1**								**1**
SUM	**25**	**1**	**10**	**1**	**43**	**1**	**7**	**8**	**5**	**4**	**4**	**13**	**122**

are typological (conventional) tools. In total, 22 retouched specimens were distinguished, among which blade forms predominate quantitatively: end-scrapers (8), truncated blades (2), micro-retouched blades (4) and a perforator (1). The flake forms are represented by 7 amorphous retouched specimens. The second group of tools are the so-called utility forms, i.e. flakes and blades with traces of their use in the form of the so-called utility retouching and utility displays (7 items in total). The most numerous of them are flakes with utility retouching (6 items). In this group, 1 blade with polish was also distinguished. Apart from the tool group, 1 flint hammer/grinder was separated in the inventory.

4. Characteristics of the collections

As previously noted, the collections of remains from individual features differ in terms of quantity, and thus in terms of quality and raw materials. In terms of saturation with finds, features 7 and 1 can be distinguished. In the remaining ones, less than 10 were discovered. In turn, in features 2, 6 and 8, single specimens were found, therefore they will be omitted in the following characteristics of the materials.

Feature 1

This provided the second largest collection of flint relics at the site. From its fill there are 25 speci-

mens made of Jurassic Cracovian flint (Fig. 3: 1–5). Most (18 pieces) are flakes, of which 11 are complete specimens and the remaining 7 are proximal, mesial and distal fragments. Apart from 1 chip, the remaining items were classified as tools. Among them, only one specimen is typologically defined – truncated blade (Fig. 3: 4). The remaining forms are typologically indefinite: 2 micro-retouched blades (Fig. 3: 1, 5), 2 retouched flakes (Fig. 3: 2, 3) and 1 flake with utility retouch.

Feature 4

Half of the 10 specimens discovered in the refill are burned out. There are almost exclusively half-products here. 5 flakes were distinguished (2 complete and 3 fragmentary) and 2 fragments of blades, includ-

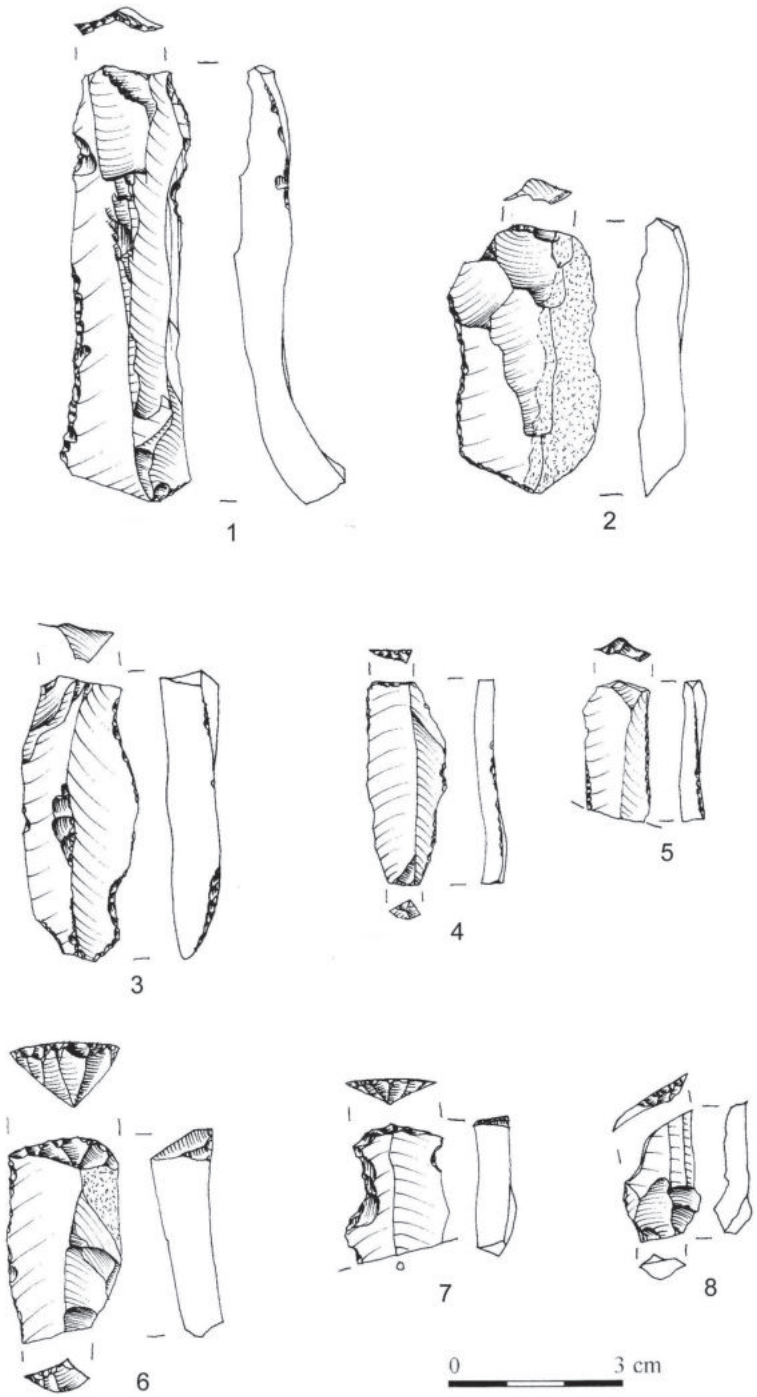

Fig. 3. Brzezie 40. LBK flint materials from features: 1 (1–5), 10 (6, 8) and 10A (7). 1–7 – Jurassic Cracovian flint; 8 – obsidian (drawn by M. Wąs).

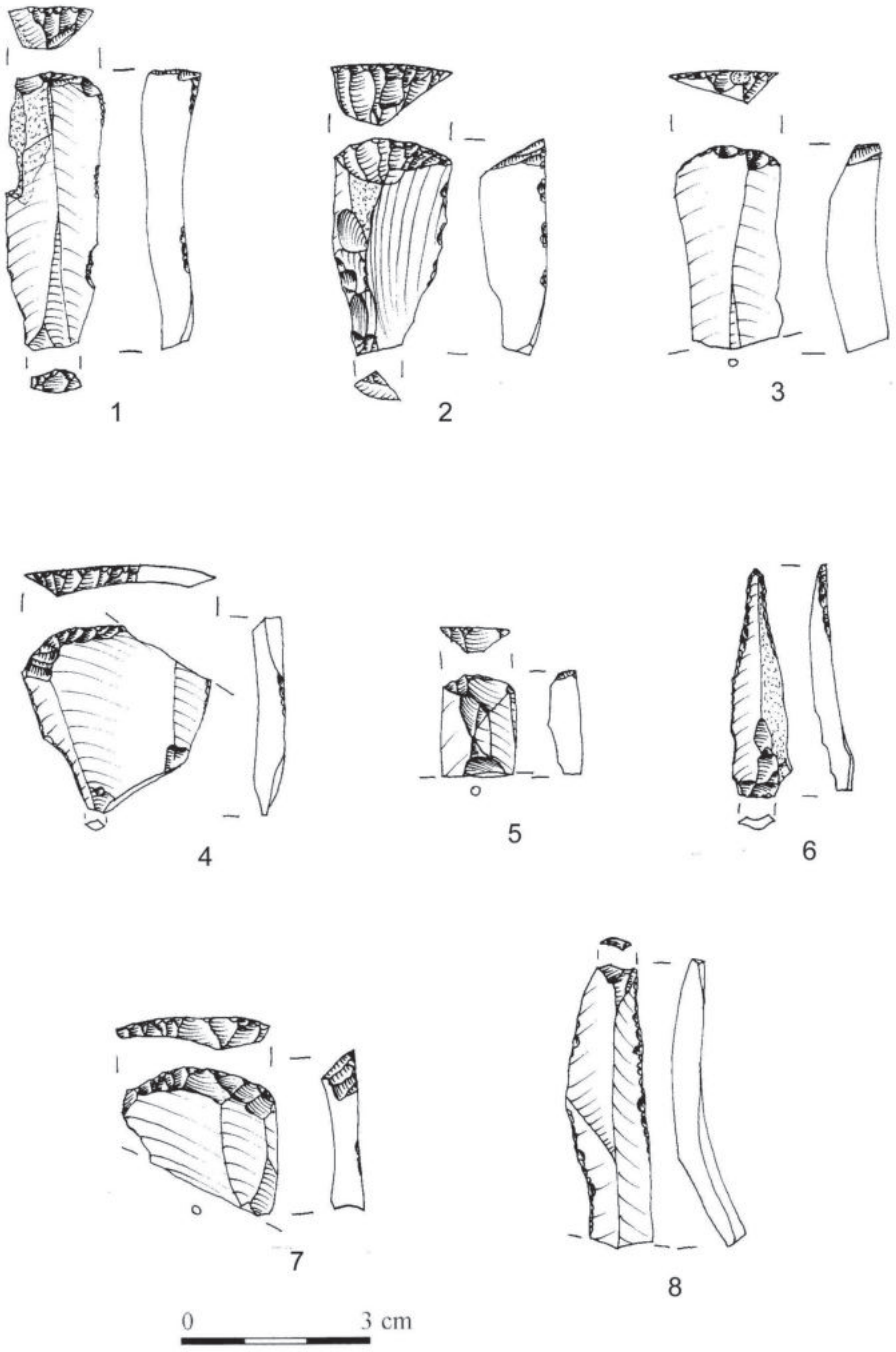

Fig. 4. Brzezie 40. LBK flint materials from features: 7 (1–6), 11 (8) and 13 (7). 1–8 – Jurassic Cracovian flint (drawn by M. Wąs).

ing 1 mesial fragment of obsidian blade. Moreover, with feature 4 come 2 chips and 1 burnt chunk.

Feature 7

This is the source of the largest collection of flint products on the site (43 items) (Fig. 4: 1–6). Among them, 1 specimen is made of obsidian, and 4 others are burned items. The quantitatively dominant group of artefacts from this feature are half-products (27 items). Flakes (21 pieces) predominate, while blades were distinguished only in 6 specimens. One of them is an obsidian distal fragment. Moreover, 10 tools were identified, most of which are typological specimens represented by 5 end-scrapers (Fig. 4: 1–5) and 1 perforator (Fig. 4: 6). The remaining ones are flake forms, both atypical retouched (2 items) and functional (2 items). The feature also contained 1 hammer/grinder, 4 chips and 1 negative chunk.

Feature 10

7 products come from this feature, of which 5 belong to the group of half-products. It is dominated by flakes over the one distal blade fragment. The remaining specimens are conventional tools: 1 end-scraper (Fig. 3: 6) and a truncated blade made of obsidian (Fig. 3: 8).

Feature 10A

The materials from this facility (8 items) are mainly flakes (6 items). Apart from them, only 1 tool was distinguished – an end-scraper with a retouched niche in one of the side edges (Fig. 3: 7). In addition, 1 burned chunk was found.

Feature 11

The collection from this feature is one of the smallest in the scale of the entire inventory. Of only 5 that belong to it, only 2 are atypical tools – 1 retouched flake and 1 micro-retouched blade (Fig. 4: 8). The remaining flints are 2 negative chunks and 1 chip.

Feature 13

Only 4 specimens were found there: 2 flakes, 1 negative chunk and 1 scraper-like tool that stands out typologically (Fig. 4: 7).

Feature 14

All the specimens found in this feature (4 pieces) are flakes – including 3 complete and one mesial fragment.

In addition to the above-mentioned collections from the ground features located in the vicinity of the LBK house, 13 artefacts were discovered in the exploration layer outside the features. Among them, 2 specimens are made of obsidian (flake and probably rejuvenation flake), 1 was thermally transformed, and the remaining 10 were made of Jurassic Cracovian flint. Almost half of them (6 items) are tools classified as atypical and utilitarian forms made on blades (2 items) or flakes (4 items). The remaining products are 3 flakes and 1 blade, and 2 negative chunks.

5. General characteristics of LBK flint industry from Brzezie 40

5.1. Technological aspects

Despite the quantitative differences between the individual features from Brzezie 40, no differences were noticed in the general level of technology used to process flints.

In the light of the available data, it is difficult to confirm unequivocally the production of half-products by the LBK communities inhabiting the site. Although there are few blades here, there are no stronger premises for establishing local flint production in the field of blade technology. Blades from Brzezie 40 have quite similar morpho-stylistic features. There were no specimens that would technically deviate from the canon of LBK blades.

Although flakes are the dominant product category in this inventory, not all of them can be considered as the result of deliberate production of flake half-products. Thus, the flake processing trend cannot be treated as the leading trend in the entire flint production at the discussed site.

Considering the flake material in general, it can be assumed that it has a varied technological origin. Thus, flakes are the result of variously targeted production activities. There are specimens that were produced as deliberate flakes or flake half-products, but there are also those that can be genetically related to the exploitation of blade, preparation and shaping of the striking platform, transformation of large flake tools, etc.

5.2. A set of flint tools

Specimens classified as tools form two groups differing in the degree and standardization of transformations that comprise their morphology and working edges.

The first one consists of typological tools, mainly such as end-scrapers, as well as truncated blades (sickles) and perforators. The second group is the utility tools. In other words, they are atypical forms of tools that cannot be categorized under any of the categories of typological tools. They are either flakes and blades with retouching modifying the edge (or edges) in an atypical manner, or "raw" blades and flakes with retouching termed utilitarian.

In total, 11 utility tools were distinguished, which is a slight minority in the entire tool inventory, but taking into account amorphous retouched flakes, they constitute a dominant group over conventional forms. The morphological diversity of products from this group shows that it is not possible to do complete, proximal, mesial and distal a half-product with specific morphometric properties, which was selected as appropriate for a given category of tools. Products from this group are probably *ad hoc* selected flakes and blades, which ensured the implementation of specific tooling tasks.

This category of tools is opposed to conventional (typological) tools (11 items). These are standardized

forms shaped by intentional retouching, whose morphology and traces of wear often correlate with one specific activity. A classic example in the LBK inventory are truncated blades (sickles, sickle inserts) related to cutting cereals and end-scrapers (e.g. Małecka-Kukawka 2001.

In the inventory from the Brzezie 40 site, the most numerous category of typological tools are end-scrapers (8 items). They are mainly made of blades, but also of flakes (1 item). The selected blade half-products transformed into scrapers came from various phases of exploitation, as evidenced by the fact that some of them have partially cortical surfaces. These are only scrapers with one scrap-edge, usually located in the distal part of the blade half-product.

The second largest typological tool in the inventory from the site in question are truncated blades (2 items). It seems that this group of tools is much more closely related to the blade half-product than it was in the case of scrapers. Moreover, negative blades were clearly preferred. The truncated edge was formed in the distal part, which is clearly visible in the case of both truncated blades, despite the differences in raw materials (flint and obsidian).

6. Characteristics of the LBK flint industry from Brzezie 40 against the background of settlement in Małopolska

The LBK flint inventory from Brzezie 40 should be described as small, especially in comparison with the previously identified sites of this unit in Małopolska. This applies in particular to inventories from other LBK settlements explored as part of rescue research in Małopolska, such as, for example, Modlnica 5. In this context, a large collection of 16 houses in the southern part of the site studied in 2002–2007 should be highlighted (Wąs 2012). This inventory, however, has some cognitive values, enriching the knowledge of LBK flint-processing. This is due to the fact that it is a fairly homogeneous collection attributed to the functioning of a single house, the relics of which and the immediate surroundings have been recognized almost entirely (Golański *et al.* 2019, 15). This situation allows the discussed inventory to be considered against the background of other LBK sites, however, it should be noted that the comparative characteristics of the flint-making industry from Brzezie 40 are only general at the present stage, showing its potential position in relation to other LBK inventories from Małopolska. An in-depth comparative analysis requires not only the most detailed description of the flint-making dynamics from the discussed site, but especially a uniform analytical apparatus used for the comparative characteristics of many Małopolska inventories. The above reasons and the fact that the chronologically analogous collections come from studies that differ not only in the scale of relic recognition, but also in a different scope of publication of their results, limit the possibility of a detailed comparison.

Significant for the comparative analysis of the materials from Brzezie 40 are the results of the research at the LBK sites in the Nowa Huta region (Kaczanowska 1971; Kaczanowska *et al.* 1987). First of all, the sites Nowa Huta-Mogiła 62 and Bieńczyce 12 and 15 and from Pleszów (sites 17–20) should be mentioned. In general, these sites contain flint materials typical for the Lesser Poland LBK, related to the production of half-products and the use of tools.

However, while in terms of typology, the Brzezie 40 inventory has numerous analogies, some differences are visible in terms of production. This is mainly related to the relatively poorly readable local production in Brzezie, especially in the field of blade technology. The lack of cores should not only be emphasized, but most of all the characteristic production waste, such as rejuvenation flakes, etc.

In general, the inventory from Brzezie 40 contains mostly elements typical for many sites of this unit in Małopolska. The percentage of individual categories within it allows to place it in the group of standard LBK inventories in southern Poland.

The raw material homogeneity of the inventory from Brzezie 40 is also typical for the LBK sites from Małopolska, located relatively close to the Jurassic Cracovian flint outcrops. The low percentage of exotic raw materials (obsidian) is part of the standard of resource management in the unit in question (cf. Milisauskas 1976; Szeliga 2007, 297).

7. Conclusions

The research carried out at the Brzezie 40 site provided a sparse flint collection related to the settlement of the LBK. It contains elements typical of the flint-making of that period and is characterized by a full cross-section of the technological and typological structure of early Neolithic flint inventories (Kozłowski 1970; Balcer 1983; 1987, 332–335).

The analysis of the inventory composition revealed a far-reaching standardization of flint-making in the discussed site, both in terms of production and use. The raw material structure with the quantitatively and technologically dominant Jurassic Craco-

vian flint, with a small amount of obsidian, alludes to analogous Małopolska inventories, especially located near the Jurassic Cracovian flint deposits (Lech 1981; Balcer 1983).

Taking into account the qualitative structure of the Neolithic inventory from Brzezie 40, its similarity to the sites referred to as "user settlements" (Lech 1981) can be noticed. The spatial context – the relationship with the residential building (the house and its surroundings) harmonizes with the settlement character. In addition, the structure of the tool group is characteristic of the so-called "home" inventories. In particular, stand out blades and flakes from the so-called utilitarian retouch category that do not show formal standardization features and metric preferences.

Although semi-raw forms dominate here in terms of numbers (with a predominance of flakes over blades), the scope and place of their production is undefined in the space of the site. It is highly probable that at least some of the finished semi-raw material (especially blades) was imported from the workshops near flint mines of the Sąspów type (Dzieduszycka-Machnikowa and Lech 1976; Lech 1987) or from other settlements where production activities were identified (e.g. Olszanica, Nowa Huta-Pleszów) (Kruk and Milisauskas 1999, 52–54). The most likely is a connection between the discovered relics and the LBK flint processing identified as a result of the exploration of the site during the wide-ranging rescue research of Brzezie 40 in the collision zone with the A-4 motorway (cf. Wąs 2012).

Flint materials of Linienbandkeramik culture from the Targowisko site 16, Kłaj commune, Małopolskie voivodeship.

1. Introductory remarks

During the excavations carried out at the Targowisko 16 site, a collection of 64 flint artefacts was obtained.

The dispersion of flint materials indicates that they are related to the relics of the LBK settlement. Their structure is made up of structural remains of one house and the aboveground features around it: pits and ditches. Since the relics of the discovered house are spatially isolated from other settlement structures, it can be assumed that the set of flint artefacts belonging to them is relatively homogeneous, as a remnant of the smallest settlement unit, which is household cluster, compact in space and time (Golański *et al.* 2019, 8).

The entire flint inventory at Targowisko 16 comes from the fillings of 4 features. It is worth emphasizing that there are clearly noticeable quantitative differences between the flint collections from the features located at the western and eastern walls. Features 3 and 8 located on the W from the house contained a total of 8 flint objects, while features 44 and 45 located on the E from the house contained as many as 53 flint objects.

2. Raw material structure

Almost the entire raw material structure of the flint inventory at Targowisko 16 is made of local Jurassic Cracovian flint (Tab. 3; Fig. 5). The share of this raw material is almost 78% of the total material (50 pieces). Thermal transformations prevent the raw material identification of three specimens (approx. 5% of the collection). Despite the changes in colour, they have features that suggest that they are probably made of Jurassic Cracovian flint, which increases its percentage in the entire inventory. There are no registered remains of other types of flint. Moreover, 11 products made of obsidian were distinguished, which constitutes about 17% of the raw material structure of the entire inventory.

Table 3. Targowisko 16. Raw material structure.

Raw material	Feature 31	Feature 44	Feature 45	Feature 63	=
Jurassic Cracovian	4	20	23	3	**50**
burned	1	1	1		**3**
obsidian	3	2	6		**11**
=	**8**	**23**	**30**	**3**	**64**

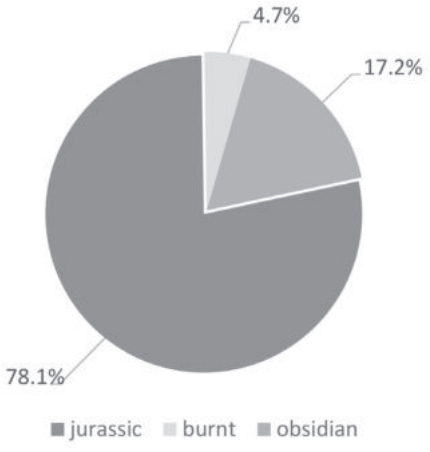

Fig. 5. Targowisko 16. Percentage share of individual varieties of raw material.

3. Technological and typological structure

The general structure of the inventory consists c products classified into 8 categories (Tab. 4; Fig. 6). Th most numerous group are the products related to flak exploitation (a total of 30 items). Flakes (19 items) an the technologically related flaking core (1 item) as we as tools made of flake half-products (10 items) consti tute nearly half of the entire inventory. The product associated with blade extraction (26 items) are slight ly less numerous. The most numerous in this grou are blades (10 items). It also includes the blade cor (1 piece) and 15 tools made of blade half-products. Th rest of the inventory consists of specimens identified a chunks (3 items). All of them are negative specimens. A microdebitage in the form of a single chip (smaller tha 5 mm) has also been identified. A single specimen re- mained indefinite in terms of technology and typology.

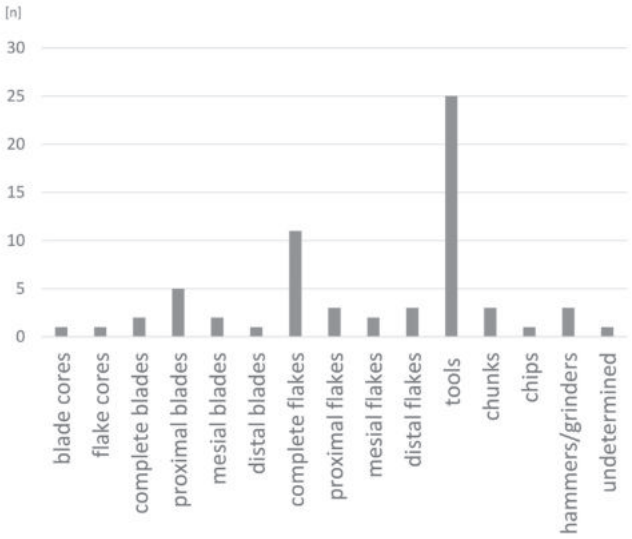

Fig. 6. Targowisko 16. The frequency of types of flint products.

Table 4. Targowisko 16. Qualitative and quantitative structure of the flint inventory.

	Feature 31	Feature 44	Feature 45	Feature 63	SUM
CORES			**2**		**2**
blade			1		1
flake			1		1
BLADES	**3**	**4**	**2**	**1**	**10**
complete	1		1		2
proximal	2	2	1		5
mesial		1		1	2
distal		1			1
FLAKES		**7**	**12**		**19**
complete		4	7		11
proximal		2	1		3
mesial			2		2
distal		1	2		3
TOOLS	**5**	**8**	**11**	**1**	**25**
truncated blades	2	1	3	1	7
perforators		1			1
micro-retouched blades	1	1	1		3
blades with polish			1		1
blades with use retouch			3		3
retouched flakes	1	3	1		5
flakes with use retouch	1	2	2		5
CHUNKS		**2**	**1**		**3**
with negatives		2	1		3
CHIPS		**1**			**1**
HAMMERS/GRINDERS			**2**	**1**	**3**
UNDETERMINED		**1**			**1**
SUM	**8**	**23**	**30**	**3**	**64**

A tool group was also distinguished in the general structure of the flint inventory at Targowisko 16. A total of 25 tools were identified and classified under 7 categories. Based on the degree of shape by retouching, two groups of tools can be distinguished. The first and most numerous group are typological (conventional) tools. In total, 16 retouched specimens were identified, among which blade forms predominate quantitatively: truncated blades (7 items), micro-retouched blades (3 items) and a perforator (1 item). Flake forms are represented by 5 retouched amorphous ones. The second group of tools are the so-called utility forms, i.e. flakes and blades with traces of their use in the form of the so-called utility retouch and utility displays (9 items in total). The most numerous of them are flakes with utility retouching (5 items). In this group, there were also distinguished 3 blades with utility retouch and 1 blade with polish. Apart from the tool group, the inventory includes 3 flint hammers/grinders, most of which are probably functionally transformed cores of various types.

4. Characteristics of collections from features

As previously noted, the collections of artefacts from individual features differ in terms of quantity, and thus in terms of quality and raw materials.

Feature 31

From its fill there are 8 specimens, 3 of which are made of obsidian (Fig. 7: 6–8). Most (5 items) are tools: 2 truncated blades (Fig. 7: 4, 5) and 3 typologically undefined forms. Moreover, 3 blades (1 whole and 2 proximal) were distinguished, bearing the characteristics of LBK blade debitage.

Feature 44

This provided the second largest collection of flint relics at the site. Among 23 specimens, 11 are half-products: 4 blades and 7 flakes. Eight tools were distinguished, among which 3 blade forms are distinguished: truncated blade (Fig. 7: 2), a perforator (Fig 7: 3) and micro-retouched blade (Fig. 7: 1). Moreover, feature 44 came with 3 undefined forms and 1 chip.

Feature 45

This is the source of the largest collection of flint products on the site (30 items). Among them, 6 specimens are made of obsidian (Fig. 8: 2, 3, 7). In addition to the half-products and tools, two specimens of used cores were also distinguished: blade and flake cores. In the group of half-products, flakes (12 pieces) clearly dominate (Fig. 8: 3), while blades were distinguished only in 2 specimens (Fig. 8: 1). Moreover, 11 tools were identified, of which only 3 are typological specimens represented by 3 truncated blades (Fig. 8: 4–6). The others are atypical and functional forms, such as obsidian blade with micro-retouch (Fig. 8: 7). Two hammers/grinders were also found at this facility.

Feature 63

Only 3 products come from this feature: a fragment of a blade, a truncated blade (Fig. 8: 8) and 1 hammer/grinder.

5. Characteristics of the LBK flint industry from Targowisko 16 on the background of Małopolska

The LBK flint inventory from Targowisko 16 should be described as small, especially in comparison with the previously identified sites of this unit in Małopolska. This applies in particular to inventories from other LBK settlements explored as part of rescue research in Małopolska, such as, for example, Modlnica 5, Brzezie 40. However, this inventory has some cognitive values, enriching the knowledge of LBK flint-making. This is due to the fact that it is a fairly homogeneous collection attributed to the functioning of a single house, the relics of which and the immediate surroundings have been recognized almost entirely (Golański *et al*. 2019, 8). This situation makes it possible to consider the inventory in question against the background of other LBK sites, but it should be noted that the comparative characteristics of the flint-making industry from Targowisko 16 are only general at the present stage, showing its potential position in relation to other LBK inventories from Małopolska. An in-depth comparative analysis not only requires the most detailed description of the flint-making dynamics from the discussed site, but especially a uniform analytical apparatus used for the comparative characteristics of many Małopolska inventories. The above reasons and the fact that the chronologically analogous collections come from studies that differ not only in the scale of relic recognition, but also in a different scope of publication of their results, limit the possibility of a detailed comparison.

Significant for the comparative analysis of the materials from Targowisko 16 are the results of the research carried out at the LBK sites in the Nowa Huta region (Kaczanowska 1971; Kaczanowska *et al.* 1987). First of all, the sites of Nowa Huta-Mogiła 62 and Bieńczyce 12 and 15 and from Pleszów (sites 17–20) should be mentioned. In general, these sites

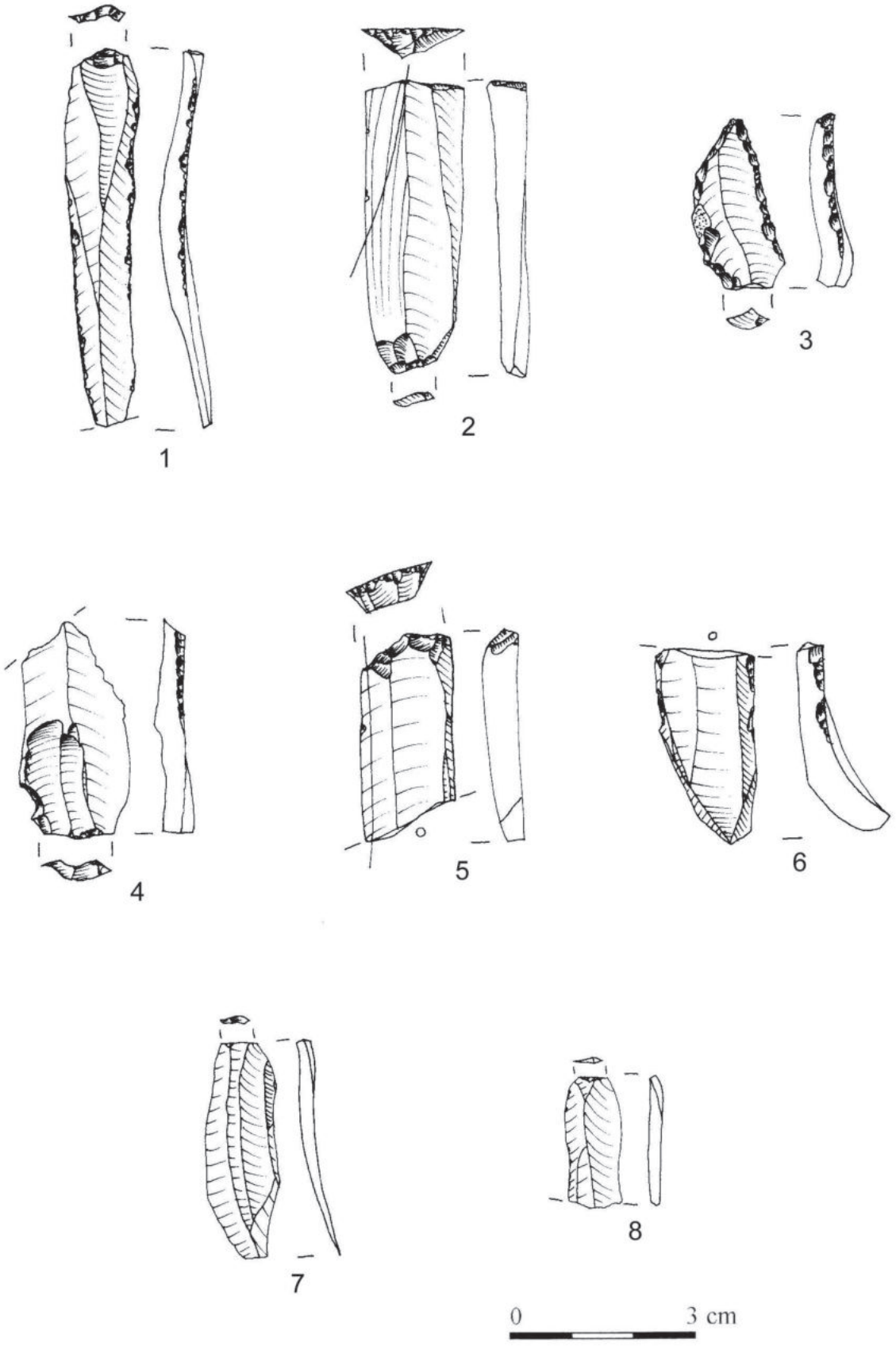

Fig. 7. Targowisko 16. LBK flint materials from features: 44 (1–3, 8) and 31 (4–7).
1–5 – Jurassic Cracovian flint; 6–8 – obsidian (drawn by M. Wąs).

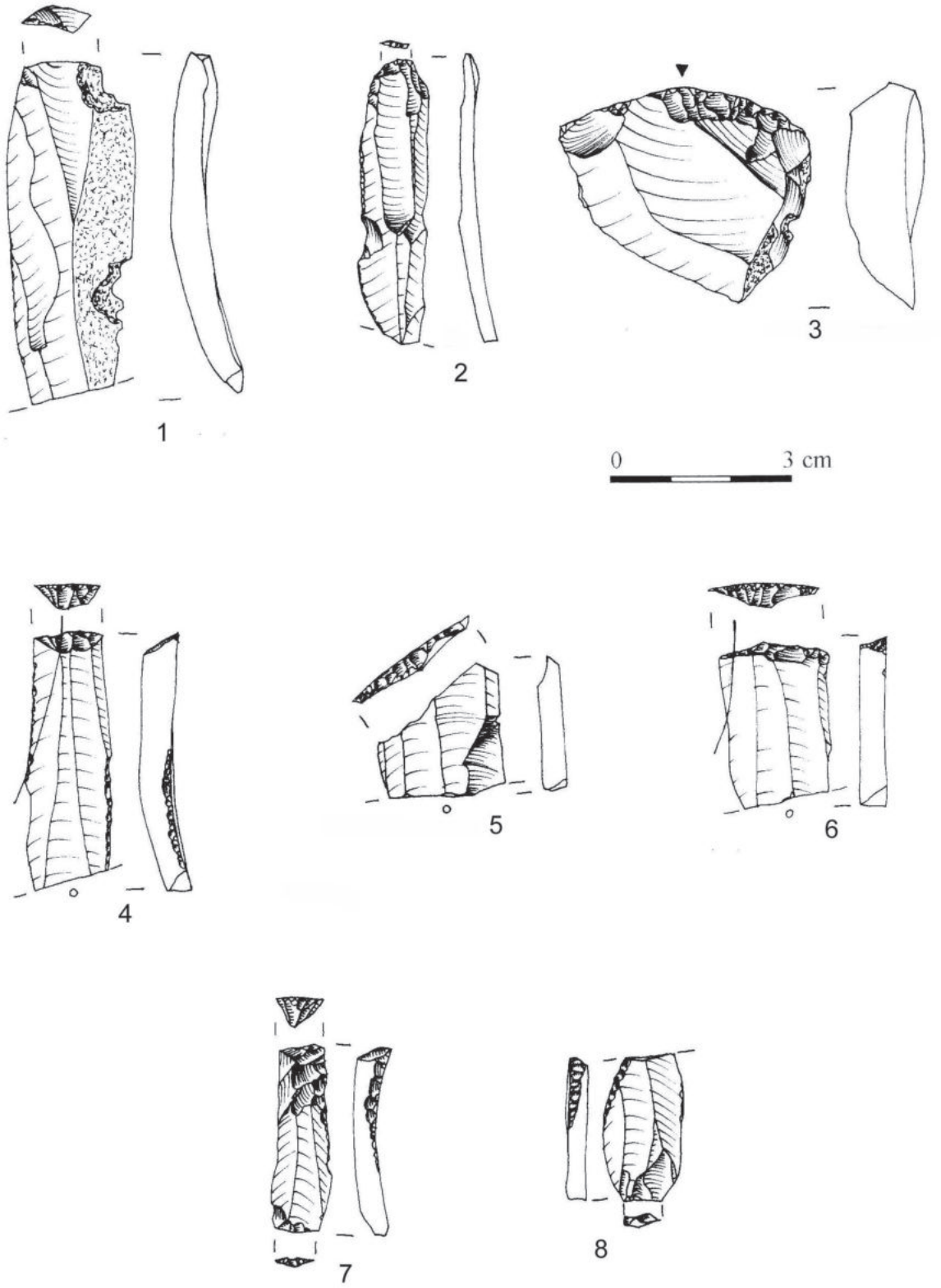

Fig. 8. Targowisko 16. LBK flint materials from features 45 (1–7) and 63 (8).
1, 4–6, 8 – Jurassic Cracovian flint; 2, 3, 7 – obsidian (drawn by M. Wąs).

contain flint materials typical for the Małopolska LBK, related to the production of half-products and the use of tools. It is worth noting that, similarly to Targowisko 16, the domination of truncated blades in the group of conventional tools is clear (Kaczanowska *et al.* 1987, 113).

However, while the Targowisko 16 inventory has numerous analogies in terms of typology, some differences are visible in terms of production. This is mainly related to the relatively poorly readable local production in Targowisko 16, especially in the field of blade technology. It should be emphasized not only the lack of cores, but most of all the characteristic production waste, such as rejuvenation flakes, etc.

In general, the inventory from Targowisko 16 mostly contains elements typical for many sites of this unit in Małopolska. The percentage of individual categories within it allows to be placed in the group of standard LBK inventories in southern Poland.

The raw material homogeneity of the inventory from Targowisko 16 is also typical of the LBK sites from Małopolska, located relatively close to the Jurassic Cracovian flint outcrops. The low percentage of exotic raw materials (obsidian) is part of the standard of resource management in the unit in question (cf. Milisauskas 1976; Szeliga 2007, 297).

6. Conclusions

The research carried out at Targowisko 16 provided a sparse flint collection related to the LBK. It contains elements typical of the flint-making of that period and is characterized by a full cross-section of the technological and typological structure of early Neolithic flint inventories (Kozłowski 1970; Balcer 1983; 1987, 332–335).

The analysis of the inventory composition revealed a far-reaching standardization of flint-making in the discussed site, both in terms of production and use. The raw material structure with the quantitatively and technologically dominant Jurassic Cracovian flint, with a small amount of obsidian, alludes to analogous Małopolska inventories, especially those located near the Jurassic Cracovian flint deposits (Lech 1981; Balcer 1983).

Taking into account the qualitative structure of the Neolithic inventory at Targowisko 16, its similarity to the sites referred to as "user settlements" (Lech 1981) can be noticed. The spatial context – the relationship with the residential building (the house and its surroundings) harmonizes with the settlement character. In addition, the structure of the tool group is characteristic of the so-called "home" inventories. In particular, chips and flakes stand out from the so-called utilitarian retouching that do not show formal standardization features and metric preferences.

Although semi-raw forms dominate here in numbers (with a predominance of flakes over blades), the scope and place of their production is undefined in the space of the site. It is highly probable that at least some of the finished semi-raw material (especially blades) was imported from the workshops near flint mines of the Sąspów type (Dzieduszycka-Machnikowa and Lech 1976; Lech 1987) or from other settlements where production activities were identified (e.g. Olszanica, Nowa Huta-Pleszów) (Kruk and Milisauskas 1999, 52–54). The most likely connection between the discovered relics and the LBK flint processing identified as a result of the exploration of the site during the wide-ranging rescue research of Brzezie 40 in the collision zone with the A-4 motorway (cf. Wąs 2012).

Flint materials of Malice culture from the Targowisko site 14–15, Kłaj commune, Małopolskie voivodeship.

1. Introductory remarks

As a result of the excavations carried out at the Targowisko 14–15 site, a collection of 97 flint artefacts related to the relics of the Malice culture settlement were discovered.

They are the remains of one house, together with large ground feature adjacent to the north-west. Since the relics of the discovered house are spatially isolated from other settlement structures, it can be assumed that the set of flint artefacts belonging to them is relatively homogeneous, as a remnant of the smallest settlement unit, which is a household cluster, compact in space and time (Golański *et al.* 2019, 8).

Almost the entire flint inventory from the Targowisko 14–15 site comes from the fills of 3 features. A total of 97 items were found in them, and only 2 specimens come from the exploration layers outside the features.

2. Raw material structure

The raw material structure of the inventory from Targowisko 14–15 consists of a similar number of Jurassic Cracovian and chocolate flint. The first one represents the local raw material resources dominated

by Jurassic Cracovian (Tab. 5; Fig. 9). Its share is 43% of the total material (41 pieces). A similar percentage (43%) includes products made of chocolate flint (42 items). From the perspective of the examined site, these specimens can be described as imported. Apart from the above-mentioned flint species, also 3 specimens of obsidian were found at the site. On the other hand, about 11% are remains, the degree of thermal transformation of which makes it impossible to indicate the type of flint raw material. They were classified as burned specimens, although it is highly probable that most of the 11 such specimens were made of Jurassic Cracovian flint.

Table 5. Targowisko 14–15. Raw material structure of the inventory.

Raw material	Feature 1	Feature 2	Feature 22	Outside features	=
Jurassic Cracovian	31	3	5	2	**41**
chocolate	41	1			**42**
burned	11				**11**
obsidian	3				**3**
=	**86**	**4**	**5**	**2**	**97**

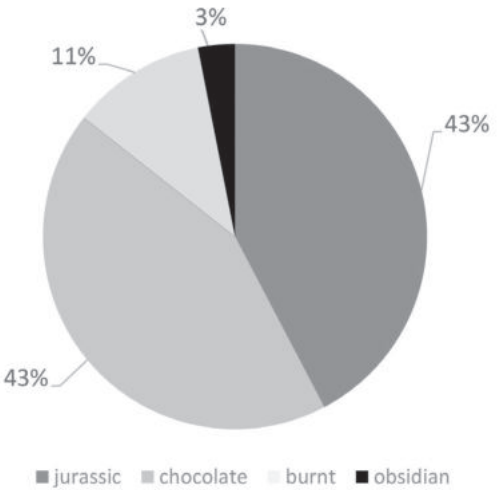

Fig. 9. Targowisko 14–15. Raw material structure of the inventory.

The technological origin of the specimens from obsidian, and especially from chocolate flint, is impossible to define. There are definitely no premises for local (within the range of the site) processing of both raw materials. It is possible that the interpretation of the presence of the above-mentioned raw materials should be sought on the functional level (e.g. Małecka-Kukawka 2001).

The raw material structure outlined above, containing three components: local raw material (Jurassic Cracovian flint), quantitively distinguished imported raw material ("chocolate") and exotic (obsidian), is typical for many other MC inventories in Małopolska (e.g. Szeliga 2007; Wilczyński 2010).

3. Technological and typological structure

The general structure of the inventory consists of products classified into 7 categories (Tab. 6; Fig. 10). The most numerous group are products related to the flake exploitation (55 items in total). The flakes (39 items), the flake core and the tools made of the flake half-products (16 items) account for over 72% of the total inventory. The products associated with blade exploitation (35 items) are slightly less numerous. Blades are the most numerous in this group (16 items). It also includes 1 blade core, 2 rejuvenation flakes from the exploitation, probably the blade core, 1 flake from the reduction of the blade core tip and 15 tools made of blade half-products. The rest of the inventory consists of specimens identified as chunks (5 items). Among them, 3 are negative and 2 are burned ones. A microdebitage in the form of two chips (smaller than 5 mm) has also been identified.

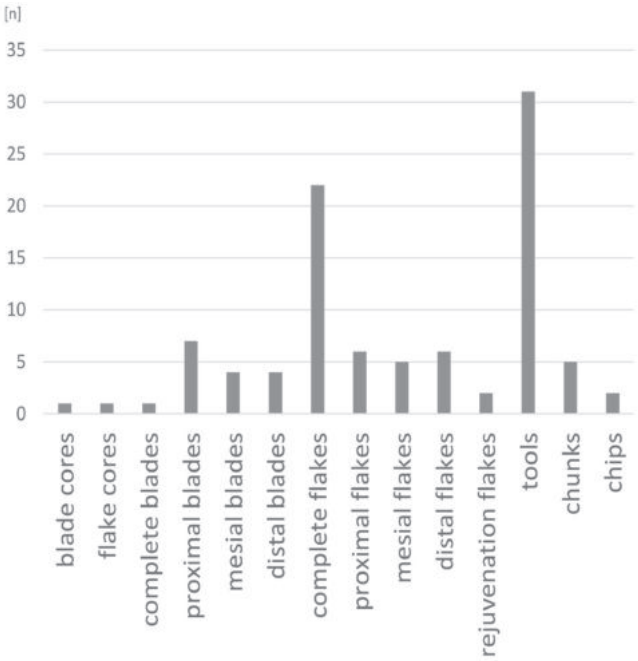

Fig. 10. Targowisko 14–15. Frequency of product types in the entire inventory.

Table 6. Targowisko 14–15. Qualitative and quantitative structure of the entire flint inventory.

	Feature 1	Feature 2	Feature 22	Outside features	SUM
CORES	**2**				**2**
blade	1				1
flake	1				1
BLADES	**13**	**1**	**2**		**16**
complete			1		1
proximal	6	1			7
mesial	4				4
distal	3		1		4
FLAKES	**36**	**1**	**2**		**39**
complete	20	1	1		22
proximal	5		1		6
mesial	5				5
distal	6				6
REJUVENATION FLAKES	**2**				**2**
TOOLS	**27**	**1**	**1**	**2**	**31**
end-scrapers	2				2
truncated blades	2				2
double-truncated blades	4				4
micro-retouched blades	6				6
blades with use retouch		1			1
retouched flakes	2				2
flakes with use retouch	11		1	2	14
CHUNKS	**4**	**1**			**5**
with negatives	2	1			3
burnt	2				2
CHIPS	**2**				**2**
SUM	**86**	**4**	**5**	**2**	**97**

In addition to the above-mentioned categories, a tool group was distinguished in the general inventory structure from the discussed site. 31 tools were identified which account for over 30% of the total inventory. They are classified into 7 types. Based on the degree of shape by retouching, two groups of tools can be distinguished.

The first numerous group are typological (conventional) tools. In total, 16 retouched specimens were identified, among which chip forms quantitatively predominate: truncations (6 pcs., including 2 single and 4 doubled ones), scrapers (2 pcs.), Micro-retouched shavings (6 pcs.). The splintered forms are represented by 2 amorphous retouched specimens. In total, 16 retouched specimens were identified, among which blade forms quantitatively predominate: truncated blades (6 items), including 2 single and 4 doubled ones), end-scrapers (2 items), micro-retouched blades (6 pcs.). The flake forms are represented by 2 amorphous retouched specimens.

The second group of tools are the so-called utility forms, i.e. flakes and blades with traces of their use in the form of the so-called utility retouch and polishing (15 items in total). The most numerous of

them are flakes with utility retouching (14 items). 1 blade with utility retouch was also distinguished in this group.

4. Characteristics of collections from features

The collections of remains from individual features discovered at the Targowisko 14–15 site differ in terms of quantity, and thus in terms of quality and raw materials. In terms of saturation with finds, they are distinguished by Feature 1. In the remaining ones (features 2 and 22), several pieces of flint relics were discovered, while feature 22 is in a strict stratigraphic relation with feature 1.

Feature 1

This is the source of the most numerous collection of flint products on the site (86 items) (Fig. 11, 12). Among them, products made of chocolate flint dominate quantitatively (41 items). Slightly fewer products made of Jurassic Cracovian flint were distinguished (31 pieces). Moreover, 3 specimens are made of obsidian, and 11 others are burned artefacts (probably both flint species present in this collection).

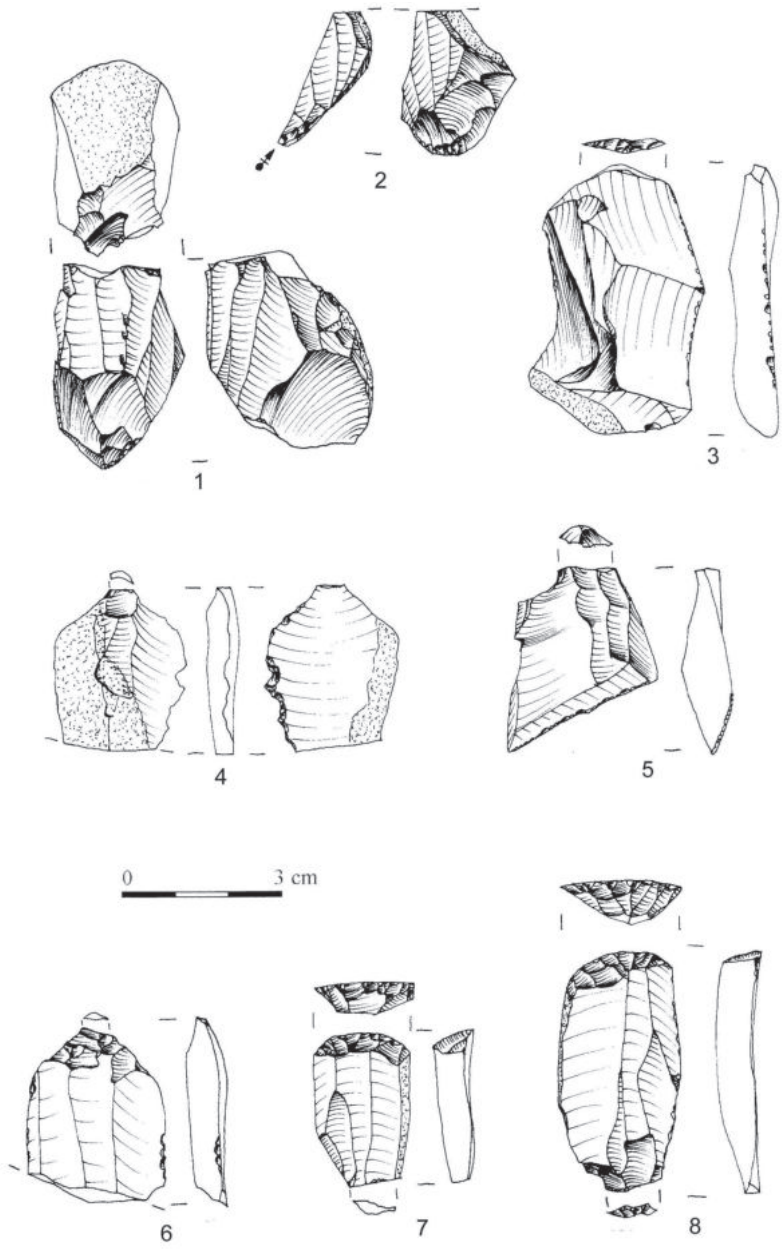

Fig. 11. Targowisko 14–15. MC flint materials from feature 1 (1–8). 1, 3–5, 7 – Jurassic Cracovian flint; 2, 6, 8 – "chocolate" flint (drawn by M. Wąs).

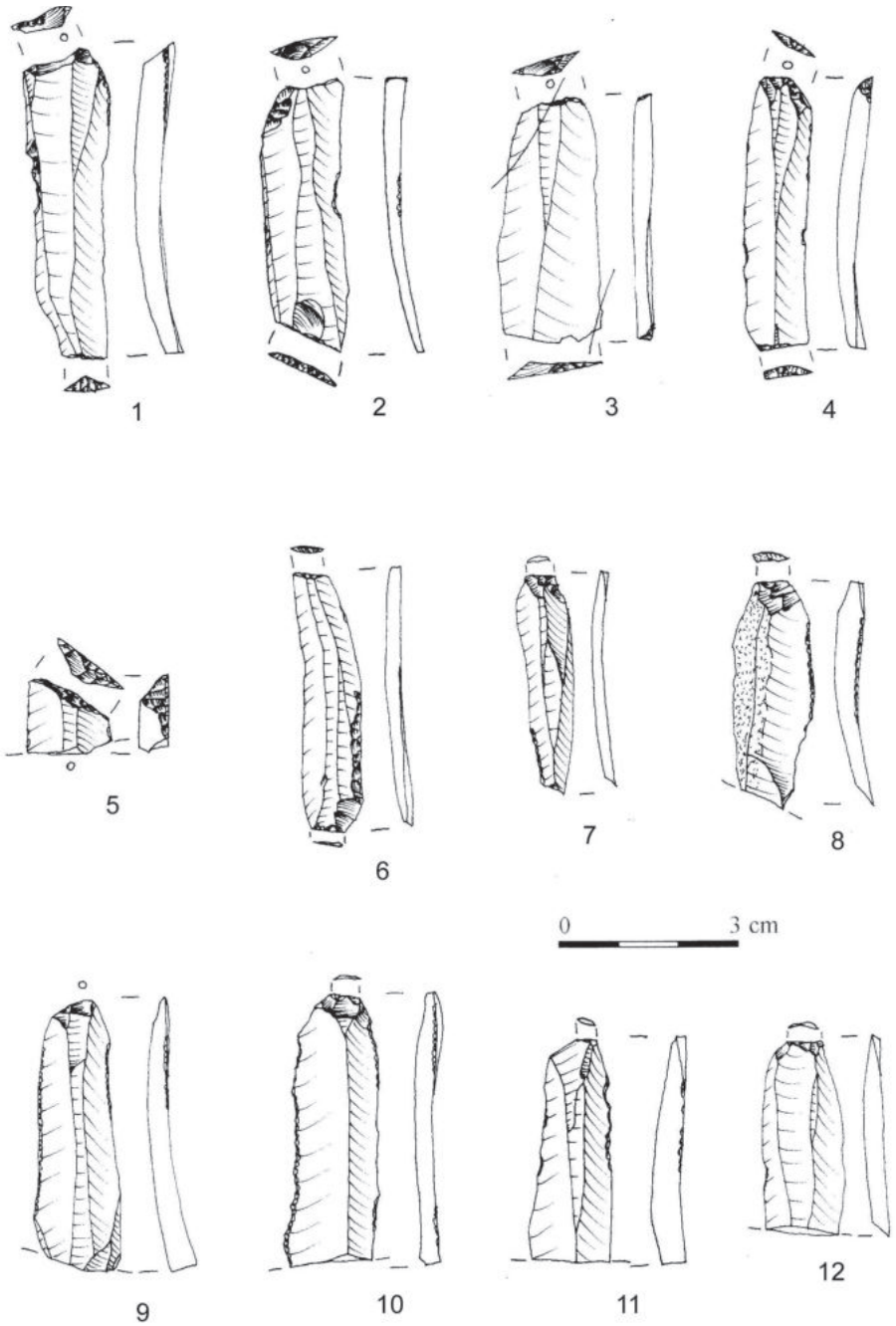

Fig. 12. Targowisko 14–15. MC flint materials from feature 1 (1–12). 1, 3, 6, 8, 10–12 – Jurassic Cracovian flint; 2, 4, 7, 9 – "chocolate" flint; 5 – burnt flint (drawn by M. Wąs).

Most of the products (36 pieces) are flakes, of which 20 are complete specimens, and the remaining 16 are proximal (5 items), mesial (5 items) and distal (6 items) fragments. A residual fragment of core is technologically related to them. The blade extraction products also stand out quantitatively (17 items). Among them, attention is drawn to 1 blade core with a strongly shortened striking platform (Fig. 11: 1). One of the flakes of chocolate flint exploited from the top of the core with distinct chip negatives is probably related to such actions (Fig. 11: 2). In addition, 2 rejuvenation flakes are technologically related to them. The most characteristic in this technological group, however, are the blades represented by 13 fragments (6 proximal, 4 mesial and 3 distal) (Fig. 12: 12).

Apart from two chips and four chunks, the remaining items were classified as tools (27 items). Among them, 8 specimens are typologically defined. There are truncated blades – doubled and single – both types made of both types of flint (Fig. 12: 1–6).

Apart from them, conventional tools are represented by 2 end-scrapers (Fig. 11: 7, 8). The remaining forms are not typologically defined: 6 micro-retouched blades (Fig. 12: 7–11), 2 retouched flakes (Fig. 11: 4, 5) and 2 flakes with utility retouching (Fig. 11: 3, 6).

Feature 2

Only 4 products were found: 1 flake, 1 proximal part of the blade, 1 fragment of the blade with utility retouching and 1 negative flake.

Feature 22

Among the 5 specimens discovered in its fill, almost all are exclusively half-products. There were 2 flakes (1 complete and 1 proximal) and 2 blades (including 1 complete and 1 distal fragment). Moreover, with feature 22 comes from the flake with functional retouching.

In addition to the above-mentioned collections from the ground features located in the vicinity of the MC house, 2 flint products were discovered in the exploration layer outside the features. Both are flakes with utility retouching.

5. General characteristics of the Malice culture flint industry from Targowisko 14–15

The source base for the characteristics of MC flint-making at the Targowisko 14–15 site are products found in stratigraphic contexts related to the relics of a single house. It should be noted that the spatial organization of the stratigraphic systems within the MC settlement unit, which is a household cluster, is different than in the case of LBK settlements. The best example of this is the lack of groups of features surrounding the house (Golański *et al*. 2019, fig. 16–17), in favour of the functioning of single large cavities located mainly north and west of the MC houses. This scheme is also clear in the case of the relics of MC in Targowisko 14–15 (Golański *et al*. 2019, fig. 18).

The collection of flint products related to the functioning of a single MC house should be assessed as small. Nevertheless, it is important for the possibility of characterizing all issues related to the MC flint-making. It should be emphasized first of all that the inventory is quite homogeneous. The first distinguishing feature is the raw material structure, in which the non-local chocolate flint has a significant share.

The second aspect that needs to be highlighted is the noticeable specificity of the stylistics of chip materials, especially those made of chocolate flint. At the present stage of research, it can be assumed that part of the MC half-products from Targowisko 14–15 is related to a different technology of exploitation and perhaps also to the use of different techniques of blade production known, for example, in LBK.

However, due to the lack of appropriate source data in the MC inventory, the problem of blade half-products production cannot be characterized in detail. It can only be assumed that such activities took place at a different site or were spatially located outside the zones identified as settlements.

5.1. Technological aspect

The basic category related to the flint production in Targowisko 14–15 is a sparse half-product material (and indirectly also blade tools). In a group of 16 specimens, there is only 1 complete blade. Only this specimen and 7 fragments of proximal blades have clear morpho-stylistic features of diagnostic proximal parts for the identification of the exploitation technique (Inizan *et al.* 1992). Most of them have features referring to analogous forms known from LBK. Such a conclusion applies especially to chips made of Jurassic Cracovian flint. This issue is slightly different in the case of the "chocolate" blades, whose morphology differs in macroscopic assessment from the canon of LBK blades. These are mainly specimens that are characterized by extraordinary regularity of edges and internegative ridges. Partially raw material used for the production of truncated blades refers to them. The blade debitage group at Targowisko 14–15 also includes the Jurassic flint blade core, which in turn has features referring to analogous products from LBK inventories.

In comparison with not very numerous blades, flakes stand out quantitatively in the MC inventory. It is probably not a homogeneous set and individual specimens may have different technological origins. However, there are no broader data to characterize this issue. Perhaps a single flake core may be a relic of local semi-raw material production.

5.2. An assortment of flint tools

The characteristics of the MC flint working in Targowisko 14–15 are based on not very numerous sources in the form of about 30 relics. In this context, the primary issue is the qualitative structure of the group of typological tools similar to the LBK inventories. Actually, it is composed of two quantitatively dominant types: truncated blades and end-scrapers. However, similarly to LBK, typological tools constitute a distinct minority here in relation to utility tools and amorphous retouched flakes.

6. Characteristics of flint-making of MC from Targowisko 14–15 against the background of settlement in Małopolska

The attempt to embed MC flint materials from Targowisko 14–15 against a broader comparative background encounters significant and objective limitations. First of all, attention should be paid to the highly unsatisfactory state of diagnosis of flint-making in this unit (see Kadrow 1990; 2009; Kozłowski 1996; Michalak-Ścibior 1996). In this context, the collection of MC flints from Targowisko 14–15 has great cognitive value as one of the few relatively fully recognized and at the same time homogeneous settlement inventories. Undoubtedly, the entire MC collection together with the analogous inventory from the southern part of the site (explored several years ago, but still unpublished results), is a more important part of the source base for MC flint-making in Małopolska, which will allow for the development of appropriately targeted analytical and comparative studies aimed at identification of its characteristic features (Wąs 2012).

7. Conclusion

The tests carried out at the Targowisko 14–15 provided small flint material related to the settlement of MC. It contains elements typical of the flint-making of that period and is characterized by a full cross-section of the technological, typological and raw material structure of the MC inventories.

From a technological point of view, the entire collection identified with the settlement of MC in Targowisko 14–15 is a conglomerate of many production episodes. Although the number of half-products materials is dominant here (with a predominance of flakes over blades), the scope and place of their production are unspecified in the structure of the settlement. This applies to both the local Jurassic Cracovian flint and the imported chocolate variety.

In general, MC's inventory of flint products from Targowisko 14–15 is "home" in character (associated with the use of flint tools), and to a much lesser extent, a workshop, the scope of which is difficult to unequivocally define. Therefore, it can be assumed that the flint collection associated with the MC house reflects the general character of the settlement, with an indication of the settlement of tool users rather than tool manufacturers. However, this aspect requires properly targeted studies.

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Archaeobotanical Macroscopic Plant Remains from the Early Neolithic Dwelling Structures at the Brzezie 40, Targowisko 16 and 14–15 Sites in Western Małopolska

Abstract

Abramów W. 2021. Archaeobotanical Macroscopic Plant Remains from the Early Neolithic Dwelling Structures at the Brzezie 40, Targowisko 16 and 14–15 Sites in Western Małopolska. *Analecta Archaeologica Ressoviensia* 16, 63–72.

The aim of this short article is to present the results of archaeobotanical analysis of macroscopic plant remains obtained in 2018–2019, during the test excavations carried out on three selected sites from Targowisko settlement region (Brzezie 40, Targowisko 16 and 14–15). Thanks to the field research strategy adopted, chronologically compact plant remains were obtained from objects included in the house structures, coming from narrow time horizons, equal to the operation time of individual Linienbandkeramik houses from the beginning of the Želiezovce phase (Brzezie 40 and Targowisko 16) and the phase of the classic Malice culture (Targowisko 14–15).

Keywords: LBK, Malice culture, macroscopic plant remains, early Neolithic, Targowisko region, SE Poland

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Introduction

The archaeobotanical macroremains came from archaeological excavations carried out in the area of early Neolithic archaeological sites, located in Brzezie (site 40), Targowisko (site 16 and site 14–15) commune of Kłaj in the Małopolskie Voivodeship (Kadrow *et al.* 2021). Between the years 2002–2007, extensive rescue excavations related to the construction of the A-4 motorway were carried out in the area of these villages. During their implementation, the remains of an early Neolithic settlement complex related to the *Linienbandkeramik* (hereafter: LBK) and the Malicka culture (hereafter: MC) were uncovered (Golański *et al.* 2021).

In 2018–2019 test excavations were carried out on three selected sites from this region, the purpose of which was to achieve several goals. One of them was the detection of such fragments of Neolithic settlement zones where only one construction phase has survived, in order to obtain material for archaeobotanical analysis from the shortest possible time periods related to the functioning of one house. Detection of settlement zones was performed a year earlier (2017) using a magnetometer as part of a slightly wider program of geomagnetic prospection (Golański *et al.* 2019).

It also should be mentioned that archaeological research has been carried out in the area of Targowisko in the past. From 2000, archaeological rescue excavations were conducted at archaeological sites no. 10, 11, 12 and 13 for the next eleven years. Such long term excavations were connected with the A-4 motorway project (Górski and Konieczny 2014, 7). During this period, a large multicultural settlement complex was revealed. Among the thousands of archaeological features, early Neolithic settlement traces were unearthed (Górski and Konieczny 2014, 11). Hundreds of soil samples were analysed from the Targowisko 10–11 archaeological site and, thanks to this research,

the remains of crops and other plants connected with LBK and MC culture were revealed (Lityńska-Zając *et al*. 2014).

The subject of the analysis and the basis of this article were organic materials from three archaeological sites: Brzezie 40, Targowisko 16 and Targowisko 14–15.

Material and methods

During above-mention test excavation, soil samples were collected and then processed on the spot by archaeologists. The selected and already dry materials were then delivered for analysis.

A total of 275 samples were analysed and the number of samples were different for each archaeological site. From Brzezie 40 there were 87 samples, 114 samples were received from Targowisko 16 and from the Targowisko 14–15 site, 74 samples were analysed. Not all of the samples contained plant remains. All details are described in the further part of this paper.

When determining plant material (macroscopic plant remains), the keys available in the literature on the subject were used (Kowal 1953; Marek 1954; Mądalski 1957; 1965; 1967; Tymrakiewicz 1962; Katz *et al*. 1965; Kulpa 1988; Skrzypczak *et al.* 2000; Cappers *et al.* 2006; Jacomet 2006; Neef *et al.* 2012; Cappers and Bekker 2013). The selected macroremains were also compared with the comparative collection collected by Joanna Abramów's Archaeological and Archaeobotanical Services in Siemianowice Śląskie, where all of the analysed materials from Brzezie and Targowiska are held.

Latin names were given after Mirek *et al.* 2002. English names were given after Anioł-Kwiatkowska 2003.

The research material was analysed using an Olympus SZ61 stereoscopic reflected light microscope, using the magnification range from 10x to 100x.

Material analysis

As mentioned above, 275 samples were analysed. For archaeological site Brzezie 40 samples were collected from 18 objects (archaeological features). From Targowisko 16 samples obtained from 64 objects. In case of archaeological site Targowisko 14–15, samples came from 29 objects. All samples contained dry mineral residue, mainly sand, and some of them had visible diaspors. The volume of the sample never reached more than 5 ml.

During analyses, we found out that some samples only contained mineral residue without any diaspors, while in some other case the samples contained only modern plant remains.

It should be noted that the selected plant remains were preserved in a rather poor condition. The significant structural losses made it difficult to precisely define the species, hence some of the designations are uncertain ("cf" before the species name). Because all three archaeological sites belong to the category of so-called "dry sites", so only the charred remains can be considered equal to the archaeological site under study (Lityńska-Zając and Wasylikowa 2005, 50). This is why the tables in this article only present those samples which contained charred plant remains.

Brzezie 40 site

As mentioned above, from this archaeological site 87 samples were analysed. As a result of microscopic observations, a total of 859 diaspors were obtained from 69 samples. In the case of 18 samples, no plant remains were found. On the basis of the analysis, a list of 17 taxa was compiled. Among them, 8 plant species were identified. Five taxa were assigned to the genus level. Three taxa were assigned to the rank of family (Tab. 1). Registered plant remains were preserved in the form of uncharred and charred specimens. As mentioned above uncharred specimens should be treated as younger material than the studied objects.

In the analysed material, the share of charred remains amounted to 11% (96 charred specimens). The vast majority, 89% (763 specimens), were uncharred and belonged to plants that were both segetal and ruderal weeds. Among the 96 burnt specimens, the remains of wild herbaceous plants and single specimens of crops – cereals were found (Tab. 6).

Charred macroscopic remains were recorded in 21 samples from seven objects: 2 (sample no. 13), 5 (sample no. 21), 7 (samples no. 24, 25, 28–30, 34, 35, 38, 41), 8B (samples no. 46, 47, 49), 10 (samples no. 60, 61), 10A (samples no. 85, 93) and from object 14 (samples no. 103–105) (Tab. 2). Among the charred remains, as already mentioned, single specimens of crops – cereals and numerous diaspora of wild herbaceous plants were identified. The share of arable crops was 6%. The remains of herbaceous plants accounted for 83%. The percentage of indeterminate specimens was 11%. It should be noted that the selected plant remains were preserved in a rather poor condition. Significant structural losses made it difficult to precisely define the species, hence some of the designations are uncertain ("cf." before the species name).

Table 1. Brzezie, site 40, Kłaj commune, Małopolskie voivodeship. List of taxa recognized in the research material (all samples).

Key: uch – uncharred; ch – charred

Taxa name	State of preservation	Number of speciemens	Number of samples
Triticum sp.	ch	1	1
Cerealia indet.	ch	5	5
Chenopodium album	ch	59	9
Chenopodium album	uch	592	61
Fallopia convolvulus	ch	2	2
Fallopia convolvulus	uch	48	32
cf. *Melandrium album*	uch	1	1
Polygonum aviculare	uch	20	10
Rumex acetosa	ch	8	6
Rumex acetosa	uch	3	3
Setaria pumila	uch	1	1
Stellaria graminea	uch	2	1
Viola arvensis	uch	1	1
Atriplex sp.	uch	1	1
Bromus sp.	ch	3	2
Chenopodium sp.	uch	3	2
Poaceae indet.	ch	6	2
Poaceae indet.	uch	23	5
Polygonaceae	ch	1	1
Betula pendula	uch	61	10
Betula sp.	uch	8	3
Indeterminate	uch	8	4
Indeterminate	ch	2	2
Total number **859**			-

Crops

Among the 6 plant remains included in this group, cereal grains were found. Unfortunately, due to the very poor state of preservation, only one fragmentarily preserved kernel was referred to as wheat (*Triticum* sp.). The remaining grain fragments were included only in undefined cereals (Cerealia indet.). The presence of wheat (*Triticum* sp.) was found in the sample from object no. 14. However, the remains of single grain kernels (Cerealia indet.) were found in objects: 5, 7, 8B and 14.

Wild herbaceous plants

A large group of charred remains were those belonging to herbaceous, wild plants, occupying two types of habitats. The species belonging to the weeds of agricultural fields (segetal) and ruderal habitats were identified. A total of 80 specimens were recorded, which accounted for 83% of the charred remains.

Such a high proportion of herbaceous plants was influenced by fat-hen seeds (*Chenopodium album*), 59 of which were registered in total in 9 samples from three objects. The highest number of seeds was found in samples no. 24 and 25 from object 7 – a total of 39 specimens. It is interesting that in the case of samples from object no. 7, among 56 charred remains, only one fragment of an undefined grain was found (Cerealia indet.), while the remaining ones belonged to wild herbaceous plants: fat-hen (*Chenopodium album*), black- bindweed (*Fallopia convolvulus*) and grasses family (Poaceae indet.).

Moreover, in the research material from the Brzezie 40 site, single specimens of brome grass (*Bromus* sp.), black-bindweed (*Fallopia convolvulus*), common sorrel (*Rumex acetosa*) and probably white campion (cf. *Melandrium album*) were recorded.

The analysed material also contained kernel fragments, which due to their state of preservation were

Table 2. Brzezie, site 40, Kłaj commune, Małopolskie voivodeship. List of selected samples containing charred macroscopic plant remains.

Key: uch – uncharred; ch – charred; g – grain; f – fragments; n – nutlets; sh – seed hulls; s – seed; un – undefined

Taxa name	State of preservation and kind of remains	Sample number																				
		13	21	24	25	28	29	30	34	35	38	41	46	47	49	60	61	85	93	103	104	105
Triticum sp.	ch; f, g																					**1**
Cerealia indet.	ch; f, g		**1**					**1**							**1**						**1**	**1**
Chenopodium album	ch; s			**25**	**14**		**3**	**4**		**2**	**1**	**1**	**3**						**6**			
Chenopodium album	uch; s	13	8											4	2	2	1	1			2	
Fallopia convolvulus	ch; n			**1**					**1**													
Fallopia convolvulus	uch; n		1			1								2				1				
cf. *Melandrium album*	ch; s	**1**																				
Polygonum aviculare	uch; n													1								
Rumex acetosa	ch; n												**1**	**1**		**1**	**1**			**3**	**1**	
Stellaria graminea	uch; s	2																				
Bromus sp.	ch; f, g																				**2**	**1**
Poacea indet.	ch; f, g				**1**																	**5**
Polygonaceae	ch; f, n												**1**									
Betula pendula	uch; sh															1	3					
Indeterminate	ch, f, un					**1**												**1**				
Indeterminate	uch, f, un										1			1	5							1

generally classified as grasses (Poaceae indet.), as well as fragments of knotweed fruits (Polygonaceae indet.).

Targowisko 16 site

As a result of microscopic observations 1,756 diasporas were obtained from 110 samples. In the case of four samples, no plant remains were found.

Based on the analysis, a list of 19 taxa was developed. Among them, 12 plant species were identified. Four taxa are labeled to the genus level. Two taxa were defined only to the rank of family (Tab. 3). Registered plant remains were preserved in the form of uncharred and charred specimens.

In the analysed material, the share of charred remains was only 1%, as only 18 diasporas preserved in this state were registered. The vast majority (1,738 specimens) were unburned remains, mainly the remains of plants that were both segetal and ruderal weeds. There have also been individual tree-owned diasporas.

Charred macroscopic remains were recorded in only 12 samples, coming from eight objects: 26 (sample no. 31), 42 (sample no. 59), 44 (samples no. 71, 74), 44B (samples no. 76, 78), 45 (samples no. 80, 85, 87), 45A (sample no. 90), 50 (sample no. 97) and from object 53 (sample no. 100) (Tab. 4).

Among the 18 charred plant remains, the remains of wild-growing arable and herbaceous plants were found. The share of arable crops was 5%. with herbaceous plants accounting for 39%. The percentage of indeterminate specimens was 56%.

Crops

In the research material from Targowisko 16, only one emmer wheat (*Triticum dicoccum*) was found among the charred remains. The presence of grain kernel was recorded in sample No. 76 from object 44B.

No other remains that could be determined as cereals were found in the analysed material.

Wild herbaceous plants

A slightly larger group of remains were those belonging to herbaceous wild plants, occupying two types of habitats. In total, the materials determined seven specimens, with species belonging to the weeds of agricultural fields (segetal) and ruderal habitats identified. Single specimens were recorded in the research material: fat-hen (*Chenopodium album*), redshank (*Polygonum persicaria*) and common sorrel (*Rumex acetosa*).

A charred seed belonging to fat-hen (*Ch. Album*) was recorded in only one sample no. 97, from object no. 50. A charred nutlet of redshank (*P. persicaria*) oc-

Table 3. Targowisko, site 16. Kłaj commune, Małopolskie voivodeship. List of taxa recognized in the research material (all samples).

Key: uch – uncharred; ch – charred

Taxa name	State of preservation	Number of speciemens	Number of samples
Triticum dicoccum	ch	1	1
Chenopodium album	ch	1	1
Chenopodium album	uch	534	79
Echinochloa crus-galli	uch	4	4
Fallopia convolvulus	uch	99	27
Polygonum aviculare	uch	237	41
Polygonum lapathifolium	uch	25	11
Polygonum persicaria	ch	1	1
Polygonum persicaria	uch	73	18
Raphanus raphaniestrum	uch	3	1
Rumex acetosa	ch	5	4
Rumex acetosa	uch	2	1
Scleranthus annus	uch	221	34
Setaria pumila	uch	101	21
Atriplex sp.	uch	1	1
Chenopodium sp.	uch	216	28
Setaria sp.	uch	20	10
Stellaria sp.	uch	1	1
Viola sp.	uch	3	3
Poacea indet.	uch	23	10
Polygonaceae	uch	5	2
Betula pendula	uch	1	1
Betula sp.	uch	7	5
Indeterminata	ch	10	7
Indeterminata	uch	162	53
Total number **1756**			-

Table 4. Targowisko, site 16, Kłaj commune, Małopolskie voivodeship. List of selected samples containing charred macroscopic plant remains.

Key: uch – uncharred; ch – charred; g – grain; f – fragments; n – nutlets; sh – seed hulls; s – seed; c – calyx; un – undefined

Taxa name	State of preservation and kind of remains	Sample number											
		31	**59**	**71**	**74**	**76**	**78**	**80**	**85**	**87**	**90**	**97**	**100**
Triticum dicoccum	ch, g					1							
Chenopodium album	ch, s											1	
Chenopodium album	uch, s			1			1	3	1		1		3
Echinochloa crus-galli	uch, g									1			
Polygonum aviculare	uch, f, n							1					
Polygonum lapathifolium	uch, n							6	1				
Polygonum persicaria	ch, n										1		
Raphanus raphaniestrum	uch, s							4					
Rumex acetosa	ch, n				1	1		2		1			
Scleranthus annus	uch, c								1				
Setaria pumila	uch, g	6				1	1	3					
Chenopodium sp.	uch, f, s							5					
Betula pendula	uch, sh									1			
Betula sp.	n												2
Indeterminata	ch, f, un	1	1	1			3		1	2			1
Indeterminata	uch, g							2					

curred in sample no. 90 from object no. 45A. In turn, single common sorrel (*R. acetosa*) was recorded in four samples. The samples containing the remains of common sorrel came from three objects: 44 (sample no. 74), 44B (sample no. 76) and 45 (sample no. 80 and 87).

In addition, 10 charred fragments of plant remains, probably some seeds, were obtained from seven samples, which due to the state of preservation, were not determined (Indeterminata).

Targowisko 14–15 site

As mentioned above, 74 samples were analysed from this archaeological site. As a result of microscopic observations, a total of 1,380 diasporas were obtained from 69 samples. No plant remains was found in 5 samples. A list of 25 taxa was constructed (Tab. 5).

Among them, 17 species of plants were identified. Four taxa are determined to the genus level, four taxa were assigned to the rank of family and the registered plant remains were preserved in the form of uncharred and charred specimens. In the case of materials from Targowisko 14–15, similar to the previously discussed archaeological sites, uncharred specimens have been treated as younger material than the objects from which the samples were taken.

In the analysed material, only 87 charred plant remains were noticed, which is only 6% of recorded diasporas. The vast majority (1,293 specimens) belonged to the modern remains of plants that were both segetal and ruderal weeds.

Charred plant remains were recorded in 22 samples from objects: 1 (samples no. 41, 42, 44, 48–50,

Table 5. Targowisko, site 14–15. Kłaj commune, Małopolskie voivodeship. List of taxa recognized in the research material (all samples).

Key: uch – uncharred; ch – charred; m – mieneralized

Taxa name	State of preservation	Number of speciemens	Number of samples
Triticum dicoccum	ch	16	5
Triticum monococcum	ch	2	2
Triticum cf. *monococcum*	ch	1	1
Triticum sp.	ch	6	2
Cerealia indet.	ch	16	7
Chenopodium album	uch	174	24
Echinochloa crus-galli	uch	1	1
Fallopia convolvulus	uch, m	22 + 3m	9+2
Galeopsis tetrahit	uch	3	3
Polygonum aviculare	uch	3	2
Polygonum hydropiper	uch	1	1
Polygonum lapathifolium	uch	56	12
Polygonum persicaria	uch	313	30
Raphanus raphanistrum	uch	10	3
Rumex acetosella	ch	1	1
Rumex acetosa	ch	4	4
Rumex acetosa	uch	12	2
Scleranthus annus	uch	142	10
Setaria pumila	uch	416	30
Stachys annua	uch	1	1
Bromus sp.	ch	1	1
Chenopodium sp.	uch	17	2
Lamiaceae	uch	5	4
Poacea indet.	ch	6	3
Poacea indet.		50	11
Polygonaceae	uch	5	3
Betula pendula (nch)	uch	1	1
Betula sp. (nch)	uch	2	2
Indeterminata	ch	39	15
Indeterminata	uch	51	13
Total number **1380**			-

60–66, 68 and 69), 1B (sample no. 67), 1C (samples no. 45, 46), 1D (samples no. 51, 55, 57) and from object 3 (sample no. 1) (Tab. 6), and belonged to arable crops (41%) and herbaceous plants (14%). The rest charred remains were indeterminate specimens and accounted for 45%.

Crops

The remains of the cereals were preserved in the form of grains. Among the 36 remains included in this group most of the grains belonged to wheats, and of these the presence of emmer (*T. dicoccum*) was the most numerous. Apart from the emmer, einkorn wheat (*T. monococcoum*) and probably einkorn wheat (*Triticum* cf. *monococcum*) were found. In the group of cereals, a single wheat kernel (*Triticum* sp.) and several fragments of cereal kernels were also found, which due to their state of preservation remained undetermined (Cerealia indet.) (Tab. 6).

Emmer wheat (*T. dicoccum*) in form of 16 grains, was found in five samples. Three of them were taken from object 1 (sample no. 42, 44 and 66) and contained in total 14 grains. Rest of remains of emmer wheat came from object 1C (sample no. 46) and 1D (sample no. 55).

The single grains of einkorn wheat (*T. monococcum*) recorded in two samples, one from object 1 (sample no. 50) and the other from object 1C (sample no. 46). On the other hand, the kernel, probably belonging to einkorn wheat (*T.* cf. *monococcum*), came from object 1D, from sample no. 57.

In addition to this, the charred material contained fragments of wheat grains (*Triticum* sp.) which were found in sample no. 46, from object 1C.

The remainder of the 16 remains were determined as undefined cereals (Cerealia indet.) and recorded in seven samples, mainly from object no. 1 (samples no.

Table 6. Targowisko, site 14–15, Kłaj commune, Małopolskie voivodeship. List of selected samples containing charred macroscopic plant remains.

Key: uch – uncharred; ch – charred; g – grain; f – fragments; n – nutlets; sh – seed hulls; s – seed; un – undefined

Taxa name	State of preservation and kind of remains	Sample number																					
		1	41	42	44	45	46	48	49	50	51	55	57	60	61	62	63	64	65	66	67	68	69
Triticum dicoccum	ch, g			5	2		5					2								2			
Triticum monococcum	ch, g						1			1													
Triticum cf. monococcum	ch, f, g												1										
Triticum sp.	ch,, f, g						5																
Cerealia indet.	ch,, f, g			4	4							2	1		1		1	3					
Chenopodium album	uch, s	17																					
Fallopia convolvulus	uch, n	3																					
Polygonum lapathifolium	uch, n	10																					
Polygonum persicaria	uch, n	38																					
Raphanus raphanistrum	uch, s																		3				
Rumex acetosella	ch, n																		1				
Rumex acetosa	ch, n		1		1			1										1					
Setaria pumila	uch, g	7																					
Bromus sp.	ch, f, g							1															
Poaceae indet.	ch, f. g				1			3							2								
Poaceae indet.	uch, g	4																					
Polygonaceae	uch, f, n												1	2									
Betula pendula	uch, sh															1							
Betula sp.	uch, sh					1																	1
Indeterminata	ch, un	3		4	3	1		4	1	2	2			1		3			3	4	2	3	3
Indeterminata	uch, un												1				1						

42, 44, 61, 63 and 64) – a total of 13 grain fragments and from object 1D (samples no. 55 and 57).

Wild herbaceous plants

A small group of remains were those belonging to wild herbaceous plants, with species belonging to the weeds of arable fields (segetal) and ruderal habitats were identified. The weeds of arable fields have a life cycle closely related to the life cycle of cultivated plants (Tymrakiewicz 1962, 7). Ruderal plants are species that accompany human settlements, develop spontaneously on soils enriched with easily soluble mineral salts, such as nitrogen compounds, phosphates or mineral salts (Kornaś 1972). A total of 12 specimens were recorded, which accounted for 14% of the charred remains. In the research material, single specimens of brome grass (*Bromus* sp.), sheep sorrel (*Rumex acetosella*) and garden sorrel (*Rumex acetosa*) were recorded. In addition, kernel fragments were found which, due to their conservation status, were identified as belonging to the grasses family (Poaceae indet.).

The grain brome grass (*Bromus* sp.) was recorded in sample no. 48 from object 1. Nutletes of common sorrel (*R. acetosa*) and three fragments of grasses carypses (Poaceae indet.) were also found in this sample.

Common sorrel fruit (*R. acetosa*) were found in materials from object 1, in samples no. 41, 44, 48 and 64.

One specimen of sheep sorrel (*R. acetosella*) was obtained from object 1, from sample no. 65.

Summary

All of the samples from all three archaeological sites contained small numbers of charred remains, with some grains of crops and seeds of weeds surviving. One thing has to be mentioned, namely that no spikelet forks were found among all charred remains. Nevertheless, based on these modest results, we gained an important information about plants used in the past in this part of Poland.

The analysed material may not contain a large group of charred plant remains, but nevertheless they are a valuable source of information crops cultivated in the early Neolithic period.

In materials from LBK culture sites Brzezie 40 and Targowisko 16, single remains of cereals such as wheat (*Triticum* sp.) and emmer wheat (*T. dicoccum*) were determined. From Brzezie 40 we also have a grains of undetermined cereals (Cerealia indet.). This results look similar to this one from Targowisko 10–11 (Lityńska-Zając *et al.* 2014, 612). Based on results from Targowisko 10–11, and other LBK culture sites (e.g. Lityńska-Zając *et al*. 2014; 2017; Mueller-Bieniek *et al*. 2018), it seems to be correct to presume that *T. dicoccum* was the main crop cultivated during LBK culture times.

In terms of the Targowisko 14–15 MC culture site, things look a little bit different. First of all, the number of crop remains was higher and more varied. Besides of undetermined cereals and *T. dicoccum* presence of *T. monococcum* was noticed. In this situation it looks also similar to results from Targowisko 10–11 (Lityńska-Zając *et al*. 2014, 613). The presence of emmer wheat kernels and a small share of einkorn wheat reflect the data obtained so far on Neolithic crops. (Klichowska 1961; 1975; Gluza 1983/1984; Jankowska 1997; Lityńska-Zając *et al*. 2017; Nowak *et al.* 2020). Single sheep sorrel specimens may indicate that such animals grazed here (cf. Nalepka 2005, 89; Pelisiak 2005, 34).

The presence of charred fat-hen and black-bindweed seeds could indicate the use of these plants, e.g. for consumption purposes (Henslowa 1962; Łuczaj 2008), but the modest number of specimens in the case of Targowisko 16 and Targowisko 14–15 does not warrant such a conclusion. A contrasting situation is in Brzezie 40, where fat-hen's seeds were more numerous and came from one particular feature. In archaeobotanical materials related to the Neolithic, an accumulation of remains of these plants was noted, e.g. in Ludwinów, province Kujawsko-Pomorskie, which indicates that fat-hen could have been collected on purpose (Mueller-Bieniek *et al*. 2019).

It should be emphasized that the infiltration of plant material into archaeological objects is influenced, *inter alia*, by the cultivation of plants, the method of harvest processing, food preparation, storage of crops for various food and economic purposes or treating leftovers as waste (van der Veen 1992, 86; Lityńska-Zając 2005, 32). It should also be remembered that probably never all species of crops and weeds growing in ancient fields in prehistoric and early historic times have been fully represented in archaeobotanical samples. For this reason, the data from archaeological excavations do not reflect the full diversity of communities and habitats (Lityńska-Zając 2005, 34).

The materials from Brzezie 40, Targowisko 16 and Targowisko 14–15 definitely require further analysis. It seems necessary to analyse the archaeological features from the functional aspect, together with the arrangement of plant remains inside archaeological features and compare them to other already known botanical material from this area.

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The Diversity of Weaponry in La Tène Culture Burials in Poland and Comments on the Non-burial Find of a Celtic Sword in Rzeszów

Abstract

Kieca P. 2021. The Diversity of Weaponry in La Tène Culture Burials in Poland and Comments on the Non-burial Find of a Celtic Sword in Rzeszów. *Analecta Archaeologica Ressoviensia* 16, 73–101

The purpose of this work is to create a comprehensive summary of arms originating from Celtic warrior graves in Poland. The largest number of artefacts comes from La Tène culture cemeteries from Lower Silesia, in Sobocisko and Głownin. Individual warrior graves came from Podgaj, Smolec and Wiązów. Other examples of weaponry were found in the Kietrz cemetery in Upper Silesia, with Lesser Poland warrior graves from Iwanowice, Aleksandrowice, and Kraków-Witkowice. From Lesser Poland we also know of alleged graves from Krakow-Pleszów and Krakow-Wyciąże. Some comments about the non-burial find of a Celtic sword from Rzeszów will also be given. A fresh consideration of the source material has corrected the earlier interpretation and reinterpreted some aspects. A new detailed chronology will also be proposed. It will also present a very broad area of connections of Celts residing in Poland.

Keywords: Poland, La Tène Culture, graves, weapon, sword, Rzeszów

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Introduction

There are twelve archaeological sites in contemporary Poland connected with the Celtic settlements of the La Tène Culture where graves with military equipment and weapons directly connected with this culture were found (Fig. 1). The Celtic settlements are concentrated in four regions of southern Poland: Lower and Upper Silesia, western and eastern Lesser Poland. The weapons finds were discovered in 18 inhumation graves, five cremation graves, two alleged graves, as well as from one context other than a grave. The non-funeral object came from the bottom of a river (Woźniak 1970; 1979; 1992, 9–17; 2004; Ginalski and Muzyczuk 1999; Czopek 2002; Bochnak 2006a; 2007; Karwowski 2007; 2008; Dulęba 2009; 2019).

The largest concentration of warrior graves of the La Tène Culture in Poland is known from Lower Silesia. Ten inhumation burials with weapons were discovered in the cemetery of Sobocisko (former Germ. Zottwitz), in Oława county: graves nos. 1–2/1891, 3/1900, 5/1908, 8/1940, 9/1940, 24/1940, 26/1940, 1/1952, 3a/1955 (Jahn 1931, 114–116, fig. 7: 2, 4–7; Hoffmann 1940, 12–18, 21–22, fig. 3, 5, 8, 12; Czerska 1966, 90, 96, fig. 4, 16; Woźniak 1970, 57–59, 287–290, fig. VIII, IX). From this site is also known a non-funeral object x/1965 (Woźniak 1970, 290). Yet linking this find with the La Tène Culture is highly doubtful, because the presence Przeworsk Culture burials on the site means that we are unable to precisely connect this find with the Celtic phase of the cemetery. Another four armoured graves come from the bi-ritual cemetery in Głownin (former Germ. Glofenau), Strzelin county. The weapons were found in one cremation burial (grave no. 2–3/1904) and in three inhumation graves: 4/1927, 1/1930, 6/1930 (Jahn 1931,

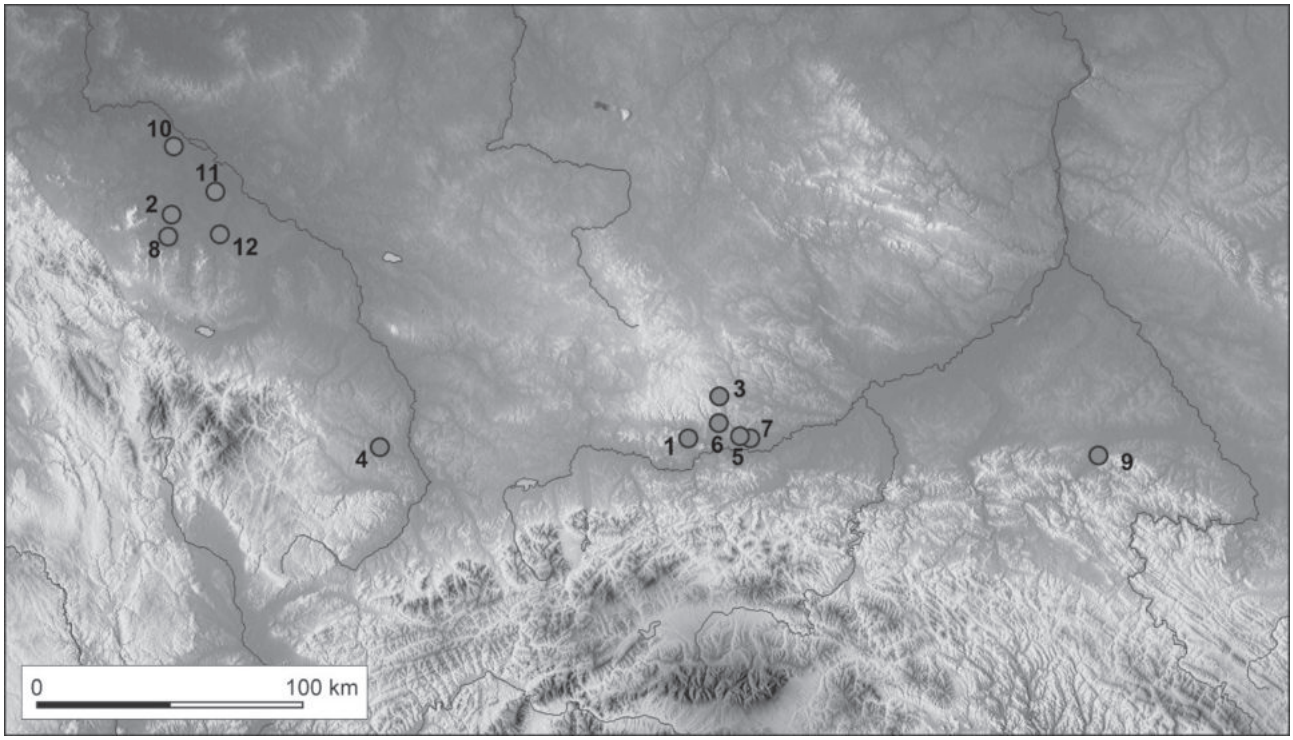

Fig. 1. Finds of weapons related to Celtic settlements in Poland (map groundwork: Free Software Foundation).

1. Aleksandrowice, Kraków county. 2. Głownin, Strzelin county. 3. Iwanowice, Kraków county. 4. Kietrz, Głubczyce county. 5. Kraków-Pleszów, Kraków county. 6. Kraków-Witkowice, Kraków county. 7. Kraków-Wyciąże, Kraków county. 8. Podgaj, Strzelin county. 9. Rzeszów/Wisłok River, Rzeszów county. 10. Smolec, Wrocław county. 11. Sobocisko, Oława county. 12. Wiązów, Strzelin county.

50–51, 110, fig. 45; 1934, 120, 123–124, fig. 15, 19, 21; Woźniak 1970, 282–283, fig. XII: 2; XIII; XV: 1–4.). Single inhumation graves of warriors were found in the cemeteries in Podgaj (formerly Jezierzyce Małe, Germ. Klein Jezeritz), Strzelin county (grave without no.; Dulęba 2019, 381) and Smolec (formerly Karncza Góra, Germ. Kentschkau), county Wrocław (grave no. I; Jahn 1931, 15, fig. 6: 3; Woźniak 1970, 284, fig. 1: 1; Dulęba 2019, 378). There is also another lone inhumation grave of a Celtic warrior which was discovered in Wiązów, Strzelin county (see general remarks: Kosicki 1996, 276). The documentation of this complex is currently either unavailable or lost.

In Upper Silesia, there is only one cemetery with just two Celtic warrior inhumation graves (nos. 1699 and 1701), which were discovered in Kietrz, Głubczyce county (Gedl 1978, 36, 39, fig. VI: 1; VIII: 1).

The four proper La Tène Culture cremation burials with weapons were discovered in Lesser Poland, all of them in the county of Krakow. Two graves furnished with weaponry (nos. 9 and 34) came from the cemetery in Iwanowice, Miechów county (Rosen-Przeworska 1946–1947, 182–183, 186, fig. 3–5; 7; 9–14, tabl. I–IV; Woźniak 1970, 107–109, fig. XXIX; XXX; XXXI: 1–5; 1991, 378). Single graves have been discovered in Aleksandrowice (grave without no.; Naglik 2001, 318; Bochnak 2005; 2006a, 167, fig. 7, 8) and in Kraków-Witkowice (grave without no.; Woźniak 1970, 327, fig. XLVII: 1; Bochnak 2005, 157), both in the county of Krakow.

Artefacts are also known from this region which were discovered as stray finds from La Tène Culture settlements. The author is aware of the fact that it is questionable whether they come from burials because of the uncertain context of these finds, but they are interpreted as artefacts probably coming from such graves in the source publication. The author decided that it was worth mentioning their existence and adding them to the catalogue. One such alleged grave is from Krakow-Pleszów and the other from Krakow-Wyciąże, Krakow county (Poleska 1996, 213, 216; 2006, 159–160, fig. 22: 1–3).

In eastern Lesser Poland there is just a single find of a sword which may be associated with La Tène Culture presence in this part of Poland and was found at the bottom of the Wisłok River in Rzeszów (an accidental discovery in 1957; see Kunysz 1962; Woźniak 1970, 341; Łuczkiewicz 1997; 2006, 46; Bochnak 2005, 43; 2006a, 46; 2006b, 168–169, fig. 3).

The weaponry artefacts related to the Celtic population and discovered on the areas of the La Tène Culture enclaves in Poland include: 22 swords and 18 scabbards, 23 spearheads, 5 spear butt caps, 22 rings of sword-belts and 7 chain belts, 6 shield-bosses, 3 bar grips and other metal elements of shield found (see Tab. 1–12). The general chronology of these artefacts is within the range of the Early (LTB) and Middle (LTC) La Tène Periods (Tab. 13).

Unfortunately it was not possible to make more detailed observations in the case of these artefacts based on metric relations between specific construction elements because the author did not have access to most of the finds and could only use data from published works.

Swords

The most numerous and important group of weaponry artefacts of La Tène culture in Poland are swords (Tab. 1). Most of these swords are examples dated to the Early La Tène Period with characteristics such as a blade tapering to a point and a prominent and sharp midrib (Woźniak 1970, 59; 1979, 213; Pleiner 1993, 61–62). The total length of these artefacts ranges between 62.2 cm (Sobocisko, grave 7/1940) and 77.5 cm (Rzeszów). The width of the blades starts from 3.3 cm (Sobocisko, grave 1/1952) to 5.6 cm (Sobocisko, grave 3a/1955). The diamond cross-section is accompanied by a prominent midrib extending from the tang to the tip. Unfortunately, the handles of some swords

Table 1. Celtic double-edged swords from the La Tène culture sites in Poland.

Locality	Type of find	Total length in cm	Handle length in cm	Blade width in cm	Notes	Dating	Literature
Aleksandrowice	Grave	90	11	4.2	Repaired blade	C1b	Bochnak 2006, fig. 8: 7–7a
Głownin	Grave 2–3/1904	81	11	4	-	C1	Jahn 1931, fig. 45: 2
	Grave 2–3/1904	81	11	4	-	C1	Jahn 1931, fig. 45: 3
	Grave 4/1927	ca. 25	-	-	Broken	B2/C1	Jahn 1934, 120–122
	Grave 1/1930	65	1	5	Broken handle	B2/C1	Jahn 1934, fig. 15: 3
	Grave 6/1930	56.8		4.8	-	B2/C1	Jahn 1934, fig. 21
Iwanowice	Grave 9	72.5	11.8	4.7	-	C1b	Rosen-Przeworska 1946–1947, fig. 9
	Grave 34	60	11	5.2	-	C1b	Rosen-Przeworska 1946–1947, fig. 3: 1
Kietrz	Grave 1699	67		5	Broken handle	B2a	Gedl 1978, fig. VI: 1
	Grave 1701	73	12	4.4	-	B2a	Gedl 1978, fig. VIII: 1
Kraków-Pleszów	Alleged grave	-	-	5	Fragment	B2/C1a	Poleska 2006, fig. 22: 2
Kraków-Wyciąże	Alleged grave	-	15	5	Fragment	B/C	Poleska 2006, fig. 22: 1
Rzeszów	River find	77.5	12	5.4	Bell-shaped cross-guard	C1a	Kunysz 1959, fig. 1, 3
Sobocisko	Grave 3/1900	22	-	5	Broken	B2a/b	Jahn 1931, fig. 7: 5
	Grave 5/1908	-	-	-	Missing	B2	Jahn 1931, 114–116
	Grave 7/1940	62.5	10.4	5.3	-	B2a	Hoffmann 1940, fig. 3: 1
	Grave 8/1940	62.3	9	5.5	In scabbard	B2a	Hoffmann 1940, fig. 8: 1
	Grave 9/1940	68	13	5.5	In scabbard	B2b	Hoffmann 1940, fig. 8: 11
	Grave 24/1940	63.5	6	6	In scabbard; broken handle	B2a	Hoffmann 1940, fig. 12: 7
	Grave 26/1940	68	8	5.3	-	B1b/B2a	Hoffmann 1940, fig. 12: 1
	Grave 1/1952	63.2	-	3.3	Broken handle	B2b	Czerska 1966, fig. 4: n
	Grave 3a/1955	70.5	5	5.6	Broken handle	B2a	Czerska 1966, fig. 16: a
Wiązów	Grave	-	-	-	Not published	B1	Kosicki 1996, 273–279

are broken, so the sword length cannot be precisely determined. Several specimens have rivets that originally bonded organic construction elements of a hilt. The amount of them varies, with two specimens coming from grave 9/1940, three of them were in graves 1/1952 and 3a/1955, five in grave 24/1940 and seven in grave 7/1940. Most of the rivet heads are bowl-shaped (only one is flat) with dimensions between 1.3 cm to 2 cm. The examples from grave 3a/1955 are relatively long (7–8 cm; Czerska 1966, 96) and their original location in the grave suggests that the rivets joined handle pieces horizontally (from left to right) not longwise (from the front to the back). The sword from Rzeszow is the only early La Tène specimen with a well-preserved 1 cm long bell-shaped cross-guard (Fig. 5: A).

Other swords are characteristic for the Middle La Tène Period with such elements as a rounded tip and a barely discernible midrib. Two specimens from grave 2–3/1904 in Głownin show a distinct bell-shaped transition from a blade to a hilt (Woźniak 1970, 59, 61–62; 1979, 213). The total length of these swords ranges between 60 cm (Iwanowice, grave 34) to 90 cm (Aleksandrowice), and the width of the blades from 4 cm (Głownin, grave 1–2/1904) to 5.2 cm (Iwanowice, grave 34). The cross-sections of the blades vary. The examined objects have diamond cross-sections with a hardly discernible midrib (Iwanowice, grave 34), as well as lenticular cross-sections (Aleksandrowice and Głownin, grave 2–3/1904). The shape of the point of a sword from Aleksandrowice suggests that it was damaged and later repaired. The swords of this type were fitted with two types of handles. The first type was similar to older handles and based on rivets like in grave 9/1940 from Sobocisko. Two such artefacts were found in this grave. In other cases, the construction of the handle was probably different. In order to keep the handle in place, the end of the tang was thickened or welded and in some of them a small protective plate was mounted. The flat end of the tang of the sword from grave 34 in Iwanowice was thicker than its middle part. The top of the tang of the sword from grave 9 in Iwanowice was reinforced with an iron oval-shaped small plate with the engraved linear ornament. The handle ends of both swords from grave 1–2/104 in Głownin also had differences. In the first example, the end of the tang was thicker than the lower part and was stamp shaped. The tang of the second sword ended in a small ball.

Unfortunately, little can be said about the swords discovered in graves 3/1900 and 5/1908 in Sobocisko, grave 4/1927 in Głownin, the grave in Wiązów, and the alleged graves from Krakow-Pleszów. A fragment of a sword from grave 3/1900 in Sobocisko is preserved in the scabbard and has an almost flat blade with a length of 22 cm and a width of 5 cm. Another fragment from grave 5/1908 at the same cemetery is now missing (Jahn 1931, 114–116, fig. 7: 5; Woźniak 1970, 288). A fragment of a sword from grave 4/1927 in Głownin has been preserved in a scabbard and has a length of 25 cm (Jahn 1931, 50–51; Woźniak 1970, 282). The sword from Krakow-Pleszów has the top of the blade preserved with a width of 5 cm, together with the handle, a blade with a diamond cross-section and a rib. The upper part of the blade of the Krakow-Wyciąże sword was preserved to 5 cm in width, together with a handle that is 15 cm long (Poleska 1996, 213, 216; 2006, 159–160, fig. 22: 1, 2). According to the latest examinations, there is some doubt as to whether it is really a sword. However, because this find has been identified as a sword in the source publication, it is presented as such in this work. The inventory of the grave in Wiązów has not yet been published.

Sword scabbards

One of the inseparable elements of the Celtic sword is a metal scabbard. From Poland, eighteen such artefacts of La Tène Culture origin are known (Tab. 2). Only eight of them have well-preserved chapes (Fig. 2). Four are heart-shaped (grave no. 8/1940, 3a/1940 in Sobocisko, grave no. 1/1930 in Głownin and Kietrz grave 1701), they correspond to the type of Iα in the typological system of de Navarro (de Navarro 1972, 21–33) and chapes of group 1 in the typology of finds from Gournay-sur-Aronde, Dep. Oise, in northern France (Lejars 1994, 17–38). Two of them are V-shaped (graves nos. 24/1940 and 26/1930 in Sobocisko), they correspond to type BII or BI by de Navarro, or group 2 or 3 of sword scabbard chapes from Gournay-sur-Aronde. While the chape found in the grave no. 9/1940 in Sobocisko is particularly wide, the poor state of preservation of this piece makes it impossible to accurately determine its type.

An interesting chape was found in the sword scabbard in Głownin, grave no. 6/1930 (Fig. 2: B). In the picture showing this scabbard (Jahn 1934, fig. 21) the backside of the artefact is presented with a clearly visible suspension-loop and a backside of the chape. As it can be seen, this artefact was very short (the height of the chape from the sword point was only 4.5 cm), but at the same time it is very solid. It is comprised of two rounded plates (1.5 x 2 cm) placed on both sides of the scabbard and bonded by a rectangular strip. Yet,

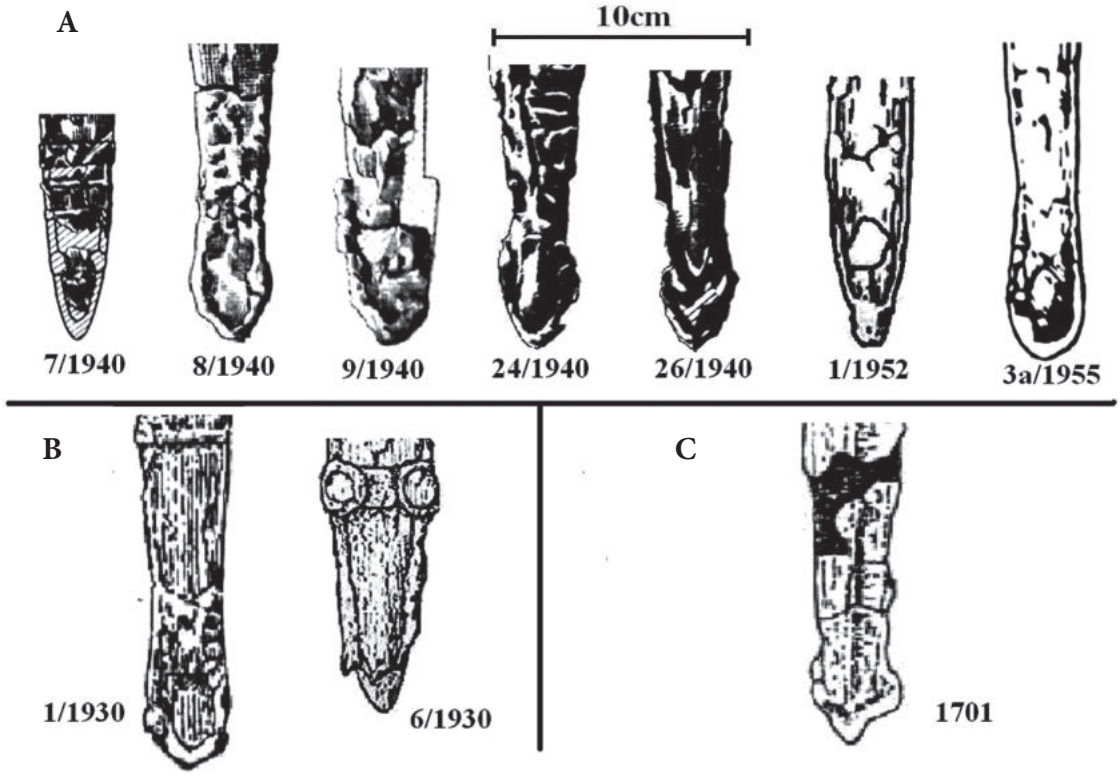

Fig. 2. Chapes of sword scabbards.

A. Sobocisko (after Hoffmann 1940; Czerska 1966); B. Głownin (after Jahn 1934); C. Kietrz (after Gedl 1978).

there is no information about the front side of that chape. Currently, there seems to be no sword dated to the LTB or LTC1 period with a similar chape. Elements that are similar in shape were particular for scabbards from later periods, e.g. the ones found in La Tène, Dist. Neuchâtel in Switzerland (de Navarro 1972, pl. XXVII, XCIV). Unfortunately, the remaining lower scabbard ends cannot be analysed due to serious damage.

All sword scabbards from Poland have preserved bell-shaped mouths (Tab. 2) conforming to type A2 in the classification of de Navarro (de Navarro 1972, 23) (Fig. 3). However, they can be distinguished among three groups corresponding to types 1, 2 and 4 in the division of sword scabbard mouth from Gournay-sur-Aronde (Lejars 1994, 31): group 1 (groups are my proposition) – bell-shaped normal, is akin to type 1 GSA (Sobocisko, graves 7/1940, 8/1940, 24/1940, 26/1940), group 2 – bell-shaped low, is akin to type 2 GSA (Sobocisko graves 1/1952, 3a/1955; Głownin grave 1/1930; Kietrz, graves 1699, 1701; Iwanowice, grave 9), whereas group 3 – bell-shaped high, is akin to type 4 GSA (Głownin grave 6/1930?; Iwanowice grave 34; Aleksandrowice; Rzeszów).

It seems that one of the most fragile elements of a scabbard is a suspension-loop (Tab. 3). Well-preserved suspension-loops were only found in six scabbards (Fig. 3). A so-called simple type of suspension-loop corresponding to type IA in the classification of de Navarro (de Navarro 1972, 37, fig. 8: 1; cf. Woźniak 1970, 59; 1979, 213) first one has a scabbard from Sobocisko, the second one came from the cemetery in Kietrz (Fig. 3: A, B).

A very interesting suspension-loop was found in the scabbard from the grave no. 6/1930 in Głownin (Fig. 3: C; Jahn 1934, fig. 21). This suspension-loop has oval plates for the rivets and a square loop with arched edges narrowing to the middle. It is similar to type 8 from Gournay-sur-Aronde (Lejars 1994, 27). The closest analogy is an artefact from grave no. 31 from the Malé Kosihy cemetery, okr. Nové Zámky in south-western Slovakia (Bujna 1995, 24–25, pl. 6: 1).

Another scabbard with a preserved suspension-loop is the artefact from grave no. 34 from Iwanowice (Fig. 3: D; Rosen-Przeworska 1946–1947, fig. 4). This suspension-loop is a specimen with brief heart-formed plates. This corresponds to type 5 of the sword scabbards from Gournay-sur-Aronde (Lejars 1994,

Table 2. Celtic sword scabbards from the La Tène culture sites in Poland.

Locality	Type of find	Scabbard mouth		Chape type		Suspension-loop type		Literature
		(after de Navarro 1972)	(after Lejars 1994)	(after de Navarro 1972)	(after Lejars 1994)	(after de Navarro 1972)	(after Lejars 1994)	
Aleksandrowice	Grave	A2	Group 4	-	-	Unusual shape	Unusual shape	Bochnak 2006, fig. 8: 5, 6
Głownin	Grave 4/1927	-	-	-	-	-	-	Jahn 1934, 120–122
	Grave 1/1930	A2	Group 2	Iα	Group 1	-	-	Jahn 1934, fig. 15: 3
	Grave 6/1930	A2	Group 4?	Unusual shape	Unusual shape	-	Type 8	Jahn 1931, fig. 21
Iwanowice	Grave 9	A2	Group 2	-	-	Unusual shape	Unusual shape	Rosen-Przeworska 1946–1947, fig. 9; 10: 1
	Grave 34	A2	Group 4	-	-	-	Type 5	Rosen-Przeworska 1946–1947, fig. 4: 2
Kietrz	Grave 1699	A2	Group 2	-	-	IA	Type 3	Gedl 1978, fig. VI: 2
	Grave 1701	A2	Group 2	Iα	Group 1	-	-	Gedl 1978, fig. VIII: 2
Sobocisko	Grave 3/1900	-	-	-	-	-	-	Jahn 1931, fig. 7: 5
	Grave 5/1908	-	-	-	-	-	-	Jahn 1931, 114–116
	Grave 7/1940	A2	Group 1	-	-	-	-	Hoffmann 1940, fig. 1: 1a
	Grave 8/1940	A2	Group 1	Iα	Group 1	IA	Type 3	Hoffmann 1940, fig. 8: 1, 1a
	Grave 9/1940	-	-	-	-	-	-	Hoffmann 1940, fig. 8: 11
	Grave 24/1940	A2	Group 1	BII or BI	Group 2 or 3	-	-	Hoffmann 1940, fig. 1
	Grave 26/1940	A2	Group 1	BII or BI	Group 2 or 3	-	-	Hoffmann 1940, fig. 12: 1
	Grave 1/1952	A2	Group 2	-	-	-	-	Czerska 1966, fig. 4: n
	Grave 3a/1955	A2	Group 2	Iα	Group 1	-	-	Czerska 1966, fig. 16: a
Rzeszów	River find	A3	Group 1	Unusual shape	Unusual shape	-	Type 4	Kunysz 1962
Wiązów	Grave	-	-	-	-	-	-	Kosicki 1996, 273–279

Table 3. Belt rings from uniform bar with round cross-section from the La Tène culture sites in Poland.

Locality	Grave	Thickness in cm	Diameter in cm	Inner diameter in cm	Making	Notes	Literature
Kietrz	1699	0.5	2.5	2	Iron	1 ring	Gedl 1978, fig. VI: 7
Sobocisko	7/1940	1.5	3.5	2	Iron	2 rings	Hoffmann 1940, fig. 3: 3, 4
	26/1940	0.8	3.5	2.6	Iron	3 rings	Hoffmann 1940, fig. 12: 5

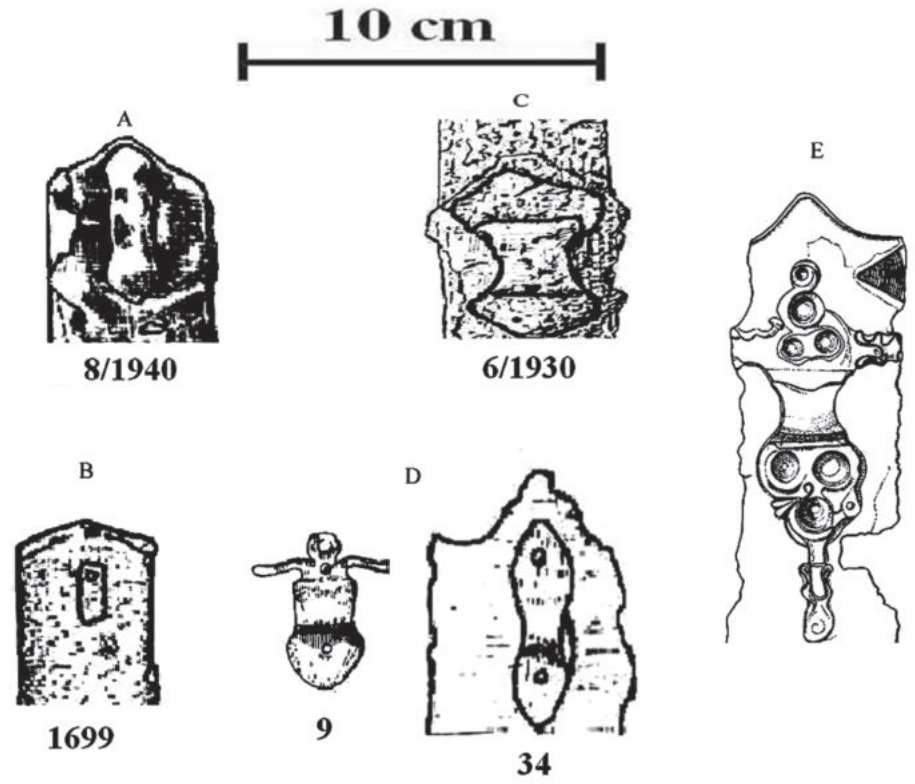

Fig. 3. Suspension-loops of sword scabbards.

A. Sobocisko (after Hoffmann 1940); B. Kietrz (after Gedl 1978); C. Głownin (after Jahn 1934); D. Iwanowice (after Rosen-Przeworska 1946–1947); E. Aleksandrowice (after Bochnak 2006a).

27). Artefacts with similarly shaped suspension-loops have been classified as type II by Bochnak in the classification of sword scabbards from Przeworsk culture (Bochnak 2005, 38, 43–44).

The suspension-loops found on the scabbards in Iwanowice in grave no. 9 and in Aleksandrowice are very particular, characterized by expanded upper plates (Fig. 3: D, E). The artefact from Iwanowice has a lower plate in heart shape, a rectangular loop and an upper plate in form of two side arms (extending only on the part of the scabbard) with a small disc above them (Rosen-Przeworska 1946–1947, fig. 9; 10: 1). In terms of its shape, a similar specimen was found in Balassagyarmat in Hungary (Szabó and Petres 1992, tab. 2–3). However, the carrying ring arms are bonded here with a strip reinforcing the scabbard throat. Thus, they are longer than the ones on the scabbard from Iwanowice, where the carrying ring arms do not extend on the whole width of the scabbard. This example of an upper plate is very rare – it may be comparable to the suspension-loop of the scabbard from Halmajugra in Hungary (Szabó and Petres 1992, pl. 16). Another suspension-loop where the arms do not extend to the throat of the scabbard was seen on the sword scabbard from Ušća in Serbia (Todorović 1974, fig. 62, 98).

Therefore, the specimen from Aleksandrowice proves to be an interesting example of carrying a suspension-loop, unique in Poland. On its extended mounting plates was an ornament in the form of openwork circles (Fig. 3: E). Three such circles are on the lower plate and form a pattern of a triangle with the tip pointing downward. Between the circles, on the one hand, appears what is likely a plastic half palmet ornament. The loop was square-shaped with arched edges narrowing to the middle and in the top part it was extended to create a top plate with wide arms overlapping the whole width of the scabbard. At the top plate appear extensive four circles; three smaller ones create a triangle with the tip directed upwards and a large circle in the middle. The top edges of the arms were also decorated with engraved arc ornamentation. Openwork decoration on the suspension-loop featured on a sword from the cremation grave from Dobova in Slovenia, (Szabó and Petres 1992, pl. 107).

This scabbard is also decorated on the front side, with floral motifs surrounding two bird heads with open beaks and marked feathers. The floral motifs are characteristic of the "Hungarian swords" style (Szabó and Petres 1992, 37–55), whereas the genesis bird's head motif originates from the middle Danube and the Hungarian Plain (Szabó and Petres 1992, 52). Similarly, an ornament engraved on the sword scabbard from Dobova was made in the "Hungarian style". Meanwhile, the bird's head motif is represented on a much older sword scabbard dating to the LTB which was found in Drňa in Slovakia (Megaw 1973, Fig. 2). A similar concept to connect the zoomorphic motifs and purely decorative (plant motifs), appears on the openwork bronze ferrule, probably from a wooden vessel, found in Brno-Maloměřice in Moravia (Filip 1956, pl. LXXVII: 4; Meduna 1992).

Under the plate, there is the reinforcing element in the form of two S-formed bars. The sword scabbard closest to this type of construction is an artefact from one of the two skeletal graves from Halmajugra in Hungary (Szabó and Petres 1992, tab. 17). The suspension-loop mounted on this scabbard is very similar to the shape of the one from Aleksandrowice (it is not so richly ornamented), however, most important is that the scabbard from Halmajugra, as with the Polish specimen, has pendant arms connected to the crossbar made of two S-shaped slats on the front of the scabbard. A similar design of connecting the suspension loops arms with an S-shaped crossbar was applied in two sword scabbards from a double cremation grave in Ritopek in Serbia (Todorović 1974, fig. 60, 62; Szabó and Petres 1992, tab. 123: 2). These S-shaped slats were also on sword scabbards from Gournay-sur-Aronde in France. Scabbards with such reinforcements are placed in group no. 7 (Lejars 1994, 38).

The scabbard of the sword from Rzeszow has a short suspension-loop with asymmetrical round plates which, like the front part of the scabbard, is decorated (Fig. 4: B; Kunysz 1962, 86–87). Ornamental sword scabbard suspension-loops are closest to the Polish lands in Moravia and Slovakia, and the

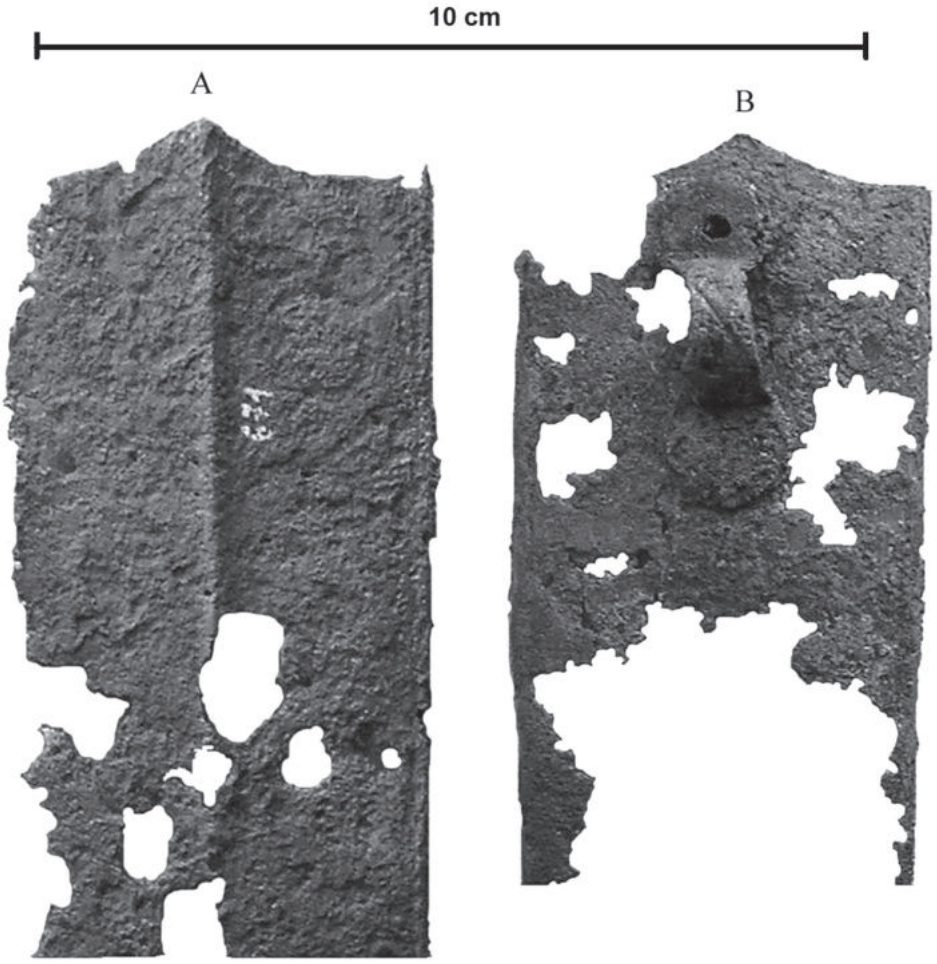

Fig. 4. Sword scabbard from Rzeszów: A – front part with "dragon pair" ornament and B – backside with decorated suspension-loop (author's unpublished archive).

Czech Republic. They come from such localities as Ponětovice part G, and the grave no. 9 (Meduna 1962, 131, fig. 14: 2; Čižmářová 2004, 207), Drňa (Megaw 1973, fig. 2, tab. 83), Detva, scabbard no. 3113 (Sankot 2005, fig. 1: 3, 3a), Kobylnice, grave no. 9 (Filip 1956, 398, fig. 37: 7; Čižmář 1975, 432, fig. 9: 7). This scabbard has on a front decorative motif, i.e. an engraved dragon-pair ornament (Fig. 5: A; Kunysz 1962, fig. 3A; Tomaszewska 1997, 147, footnote 4; Bochnak 2005, 43, 154–155; Łuczkiewicz 2006, 46). Based on the detailed analysis of the image presented by Kunysz and the examination of the artefact, it is possible to assume that this was an ornament of I or I/III type. Above these ornaments is another motif of carved arches exactly below the line of scabbard mouth and extending over its whole width. This artefact is also an interesting example due to its characteristic chape consisting of two stripes (not preserved). According to Kunysz, before the restoration, the specimen from Rzeszow had two slightly apart horizontal stripes in the bottom part of the scabbard. While analysing the picture from the publication of Kunysz, it is possible to discern a bottom strip placed 9 cm over the tip of the blade. Another strip is barely noticeable, however, with some effort the arched strip can be seen slightly above the bottom strip – 17 cm from the tip of the blade (Fig. 5: B). The mounting discs on the front of the scabbard were placed close to the bottom strip (Fig. 5: C). Kunysz does not mention any discs close to the upper strip. In the author's view, such a con-

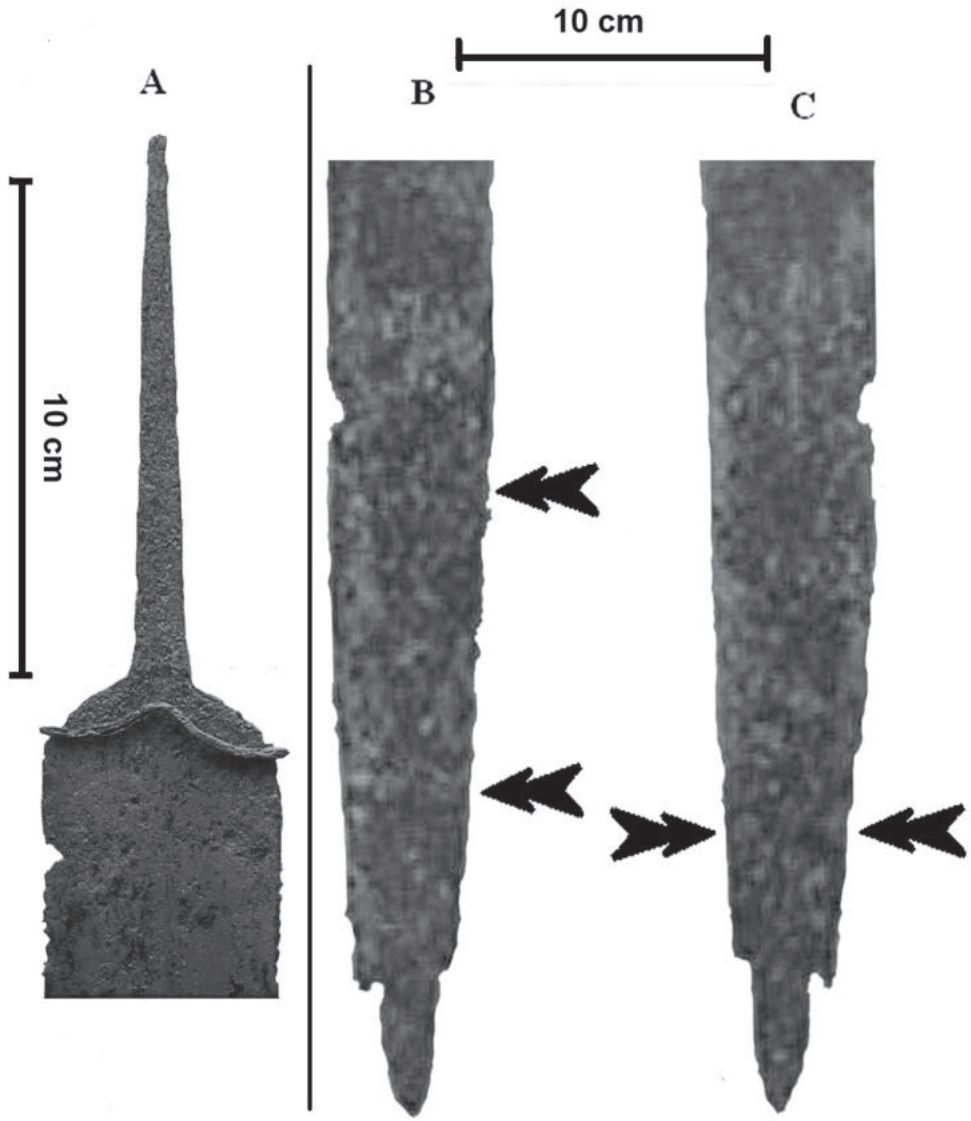

Fig. 5. Sword from z Rzeszów: A – the bell-shaped cross guard (after Łuczkiewicz 1997) and the lower part of the scabbard with chape elements: B – back side and C – front side (after Kunysz 1962).

struction of the chape may suggest that the scabbard was modified or repaired in the past. The tendency to repair or modify scabbards was particular for Central and Eastern Europe in both the LTB and LTC periods An example of this practice is a sword scabbard coming from the museum in Ruse in south-eastern Bulgaria (Anastassov 2007). There also occurred some repairs, resulting in a pre-mounted horizontal crossbar at the entrance of the sword scabbard was again placed in ¾ of its length. (Anastassov 2007, 170, fig. 3–5). According to the author, the appearance of the scabbard is the result of repair (Anastassov 2007, 171). Thus, the conclusion can be drawn that the scabbard from Rzeszów might have undergone such changes, as this would substantiate its form (especially that of the chape).

Unfortunately, nothing precise also can be said about the scabbards from the graves no. 4/1927 from Głownin and no. 3/1900 from Sobocisko, because these specimens have been preserved very fragmentarily. The sword scabbard from grave no. 5/1908 in Sobocisko has been lost together with all inventory of the grave (Woźniak 1970, 288). The inventory – including the scabbards – of the grave from Wiązów has not yet been published (see Kosicki 1996, 276).

Sword-belts

One of the vital and indispensable elements of the equipment of a Celtic warrior fighting with a sword was a sword-belt. Among the Celtic burials from Poland, there are numerous artefacts constituting fragments of soft, stiff and half-stiff (chain) belts.

The sword-belt rings were made of iron or bronze. The 24 specimens originating from the Celtic burials found in Poland can be divided into two groups by means of their structure. The first group consists of six rings made from a uniform bar with a round cross-section (Tab. 3). The second group consists of eighteen hollow inside belt rings made of two iron or bronze plates (Tab. 4). According to the division proposed by Raftery (1988, 1–4), one can distinguish two major types between the items of the second group. Their division has been carried out taking into account the construction of the belt rings. The first type is represented by the specimen from grave no. 1–2/1891 in Sobocisko. This bronze belt ring is made from two moulded plates respectively connected using three small rivets. Traces of the rivet are located at the surface of the artefact, in the form of three small recesses. The rest of the belt rings represent the second type, and their design is completely different. They were formed in two ways: one way was the imposition of the edge of one half on the second and lapped splice (for example ring from grave no. 3a/1955 from Sobocisko). The second way of connecting plates, according to Raftery (1988, 2), requires the application of soldering because one cannot see the place where the adages are joint. The rings from both warrior graves from the Kietrz cemetery have this kind of construction. Unfortunately, there are no more details about the construction of other torpid belt rings, so their classification is not sure.

Chain belts were discovered in seven graves (Tab. 5). The belt type most frequently found in Poland is type 7 according to Rapin's typology (Rapin 1987, 536, fig. 9: 7). These belts came from grave no. 34 in Iwanowice (Fig. 6: C), the alleged warrior grave in Kraków-Pleszów (Fig. 6: D) and grave no. 2–3/1904 from Głownin (Fig. 6: A). The last specimen, in contrast to the previous ones, has an engraved decoration on its joining ring and links.

A frequent type in La Tène Culture was a belt with long, repeatedly twisted links. It resembles type 5 (Rapin 1987, 536, fig. 9: 5), which in Poland was found

Table 4. Torpid belt rings from the La Tène culture sites in Poland.

Locality	Grave	Thickness in cm	Diameter in cm	Inner diameter in cm	Making	Notes	Literature
Kietrz	1699	1.4	3.8	0.5	Iron	1 ring	Gedl 1978, fig. VI: 5
	1699	-	-	-	Iron	Fragment	Gedl 1978, fig. VI: 6
	1701	1	3.4–3.5	1–1.2	Iron	3 rings	Gedl 1978, fig. VIII: 5–7
Sobocisko	1–2/1891	-	-	-	Bronze	1 ring	Jahn 1931, fig. 7: 2, 2a
	8/1040	0.8	2.5	0.4	Bronze	3 rings	Hoffmann 1940, fig. 8: 2
	9/1040	1	3.4	1.6	Bronze	3 rings	Hoffmann 1940, fig. 8: 7
	24/1940	0.8	3.5	0.6	Iron	3 rings	Hoffmann 1940, fig. 12: 10
	3a/1955	1	3	0.3	Bronze	3 rings	Czerska 1966, fig. 16: d, g

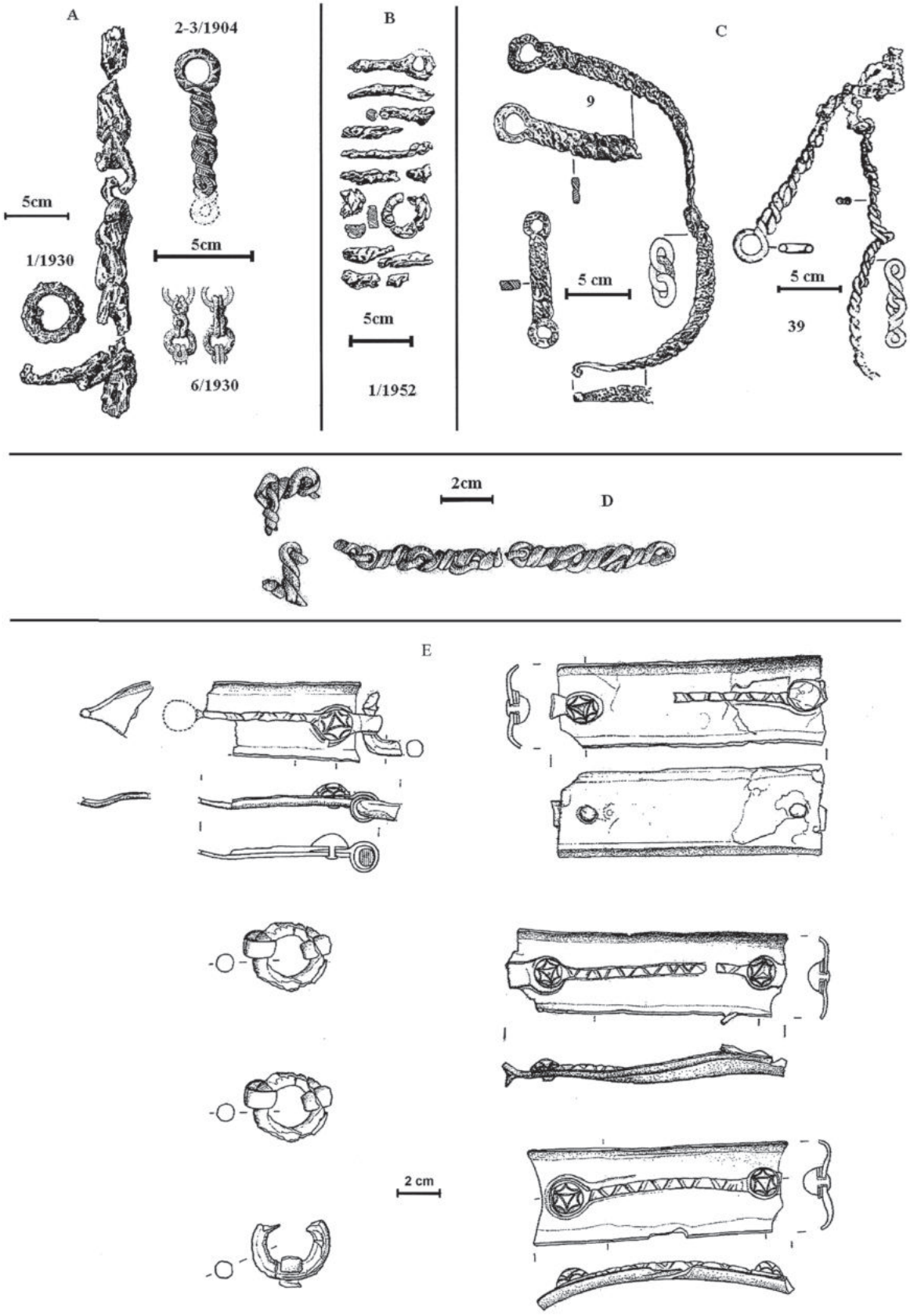

Fig. 6. Chain-belts and segmented belt.

A. Głownin (after Jahn 1931); B. Sobocisko (after Czerska 1966); C. Iwanowice (after Rosen-Przeworska 1946–1947); D. Kraków-Pleszów (after Poleska 2006); E) Aleksandrowice (after Bochnak 2006a).

Table 5. Chain belts from the La Tène culture sites in Poland.

Locality	Type of find	Type (after Rapin 1985)	Preserved length in cm	Notes	Literature
Głownin	Grave 2–3/1904	7	7.5	Fragment with ornamentation	Jahn 1931, fig. 45: 4
	Grave 1/1930	6	45	5 fragments	Jahn 1934, fig.15: 4
	Grave 6/1930	3	9	Ring and one piece of chain	Jahn 1934, fig. 19: 20
Iwanowice	Grave 9	8	44 and 13	Whole belt preserved	Rosen-Przeworska 1946–1947, fig. 10: 3; 11: 1; tab. IV: 13–16
	Grave 34	7	55	Whole belt preserved	Rosen-Przeworska 1946–1947, fig. 5, tab. IV: 12
Kraków-Pleszów	Alleged grave	7	22	3 fragments	Poleska 2006, fig. 22: 3
Sobocisko	Grave 1/1952	5	-	36 fragments	Czerska 1966, fig. 4: o

in grave 1/1952 in Sobocisko (Fig. 6: B). A rare type of chain sword-belt was discovered in grave 6/1930 in Głownin (Fig. 6: A). It is a 9 cm-long fragment of the type 3 sword-belt (Rapin 1987, 536, fig. 9: 3). Another example is the specimen found in the same cemetery in grave no. 1/1930 (Fig. 6: A). These types of belts belong to type 6 (Rapin 1987, 536, fig. 9: 6) and are also called *Fuchsschwanzketten* in the corresponding German terminology (Schönfelder 1998, 79–80). Yet another example is the so-called armoured belt (Filip 1956, 170), decorated with the inscribed ornament and representing type 8 (Rapin 1987, 536, fig. 9: 8). It was found in grave no. 9 in Iwanowice (Fig. 6: C). The last artefact related to the metal Celtic belts is the artefact found in the warrior's grave in Aleksandrowice (Fig. 6: E; Bochnak 2006a, fig. 7: 1–7). This one is different as it is not a chain belt but a segmented belt, an almost unique phenomenon in Central Europe. The only known counterpart is the belt of the same construction discovered in grave no. 47 in the cemetery in Brežice in Slovenia (Božič 1991, 475; Szabó and Petres 1992, pl. 103). However, in this case, it appears that it was not used to carry the sword, but only as a decorative element of the clothing. This theory is substantiated by the fact that in the above-mentioned grave from Brežice, an armoured chain belt of type 8 according to Rapin's typology was also found. Thus, this chain belt seemed to be used for carrying the sword, while the segmented belt was a decoration.

Spearheads and spear butt cups

Spearheads are another extensive category of metal weaponry elements originating from Celtic graves in Poland and are known from 19 graves. It is possible to discern the differences and therefore divide them into four groups (Tab. 6). The spearheads were divided according to the following features: total length, length and width of the blade, length of the socket and the shape of the lower part of the blade. The following factors were also decisive: LB/LS – a ratio of the length of the blade to length of the socket; LB/WB – ratio of the blade length to the width of the blade; TL/LS – ratio of total length to length of the socket.

Group I: the spearheads with short socket, long and narrow blade and significant rib continuing the line of the socket (Fig. 7: I).

Such specimens are known from graves 9 and 34 in the Iwanowice cemetery (Fig. 7: I/B; I/C; Rosen-Przeworska 1946–1947, 184, 187–188, fig. 3, 12–14) and the grave from Aleksandrowice (Fig. 7: I/D; Bochnak 2006a, 168, fig. 8: 8, 8a). It is very likely that the fragmentarily preserved spearhead from grave 2–3/1904 in Głownin (Fig. 7: I/A ; Jahn 1931, 14, fig. 7: 6) belongs to this group.

In this group is a specimen from grave no. 9 in Iwanowice which has the ornament engraved on the socket (Fig. 7: I/B; Rosen-Przeworska 1946–1947, ryc. 14: 1). Similarly decorated sockets can be encountered elsewhere on artefacts from Central and Eastern Europe. Spearheads with such decoration have been discovered in the cemeteries of Dubnik, in grave 30 (Bujna 1989, 230, tab. XXXIII: 4), and Maňa, in grave 59 (Benadik 1983, 34, tab. XXIII: 3), both locations in the Nové Zámky District in Slovakia.

G**roup II** is the most numerous. It is represented by the spearheads with a wide blade and significant rib continuing the line of the socket (Fig. 8).

Within this group, there is the following subdivision: sub-group IIA – long, wide and a laurel blade

Table 6. Parameters of Celtic spearheads from the La Tène culture sites in Poland.

Locality	Grave	TL	WB	LS	DH	LB/ LS	LB/ WB	TL/ LS	Notes	Group	Literature
Aleksandrowice	No number	39	5	7	2	4.7	6.4	5.5	-	I	Bochnak 2006, fig. 8: 8, 8a
Iwanowice	32	32.5	3	5.8	2	4.6	8.9	5.6	-	I	Rosen-Przeworska 1946–1947, fig. 3: 2
	9	28.2	5	6.8	2	4.2	4.2	4.1	-	I	Rosen-Przeworska 1946–1947, fig. 13: 14
Głownin	2–3/1900	-	5.5	6.5	2	-	-	-	Broken	I	Jahn 1931, fig. 7: 6
Sobocisko	7/1940	44	10.5	9	2	3.8	3.3	4.8	-	II A	Jahn 1931, fig. 7: 7
	24/1940	38	10	6.5	2	4.8	3.1	5.5	-	II A	Hoffmann 1940, fig. 12: 11
	9/1940	37	10	8.5	2	3.3	2.8	4.3	Damaged	II A	Hoffmann 1940, fig. 8: 3
	3a/1955	35	10	9.5	2	2.6	2.5	3.6	-	II A	Czerska 1966, fig. 16: y
Kraków-Witkowice	1	37	7	10	2	2.7	3.8	3.7	-	II B	Woźniak 1970, fig. XLVII: 1
Sobocisko	1–2/1891	40	6.5	15	2	1.6	3.8	2.6	-	II B	Jahn 1931, fig. 7: 4
	8/1940	37	6.5	13.5	2	1.7	3.6	2.7	-	II B	Hoffmann 1940, fig. 8: 3
	26/1940	31	7.7	10.5	2	1.9	2.6	2.9	-	II B	Hoffmann 1940, fig. 12: 6
Kietrz	1701	26	7.7	8	1.5	2.2	2.3	3.2	-	II C	Gedl 1978, fig. VIII: 3
	1699	24	8.6	8	1.8	2	1.8	3	-	II C	Gedl 1978, fig. VI: 3
Sobocisko	1/1952	29.4	4.4	5.4	2	4.4	5.4	5.4	-	III	Czerska 1966, f ig. 16: d
	3/1900	20.5	3.4	5	2	3.1	4.5	4	-	III	Jahn 1931, fig. 7: 7
Głownin	1/1930	60	8.5	31.5	2.5	0.9	3.3	1.9	-	IV	Jahn 1934, fig. 15: 1
Smolec/ Karncza Góra	1	36	4	24	3	0.5	0.5	1.9	-	IV	Jahn 1931, fig. 6: 3
Podgaj	No number	-	-	-	-	-	-	-	Unknown	-	Dulęba 2019, 381
Sobocisko	1-2 1891	-	-	8.8	-	-	-	-	Damaged	-	Jahn 1931, fig. 7: 6
	5/1908	-	-	-	-	-	-	-	Lost	-	Jahn 1931, 115; Woźniak 1970, 288
Wiązów	No number	-	-	-	-	-	-	-	Unknown	-	Kosicki 1996, 276
		-	-	-	-	-	-	-	Unknown	-	

Metric features: TL – total length in cm; WB – width of a blade in cm; LS – length of the socket in cm; DH – diameter of the hole in the socket in cm; LB/LS – a ratio of the length of the blade to length of the socket; LB/WB – ratio of the blade length to the width of the blade; TL/LS – ratio of total length to length of the socket

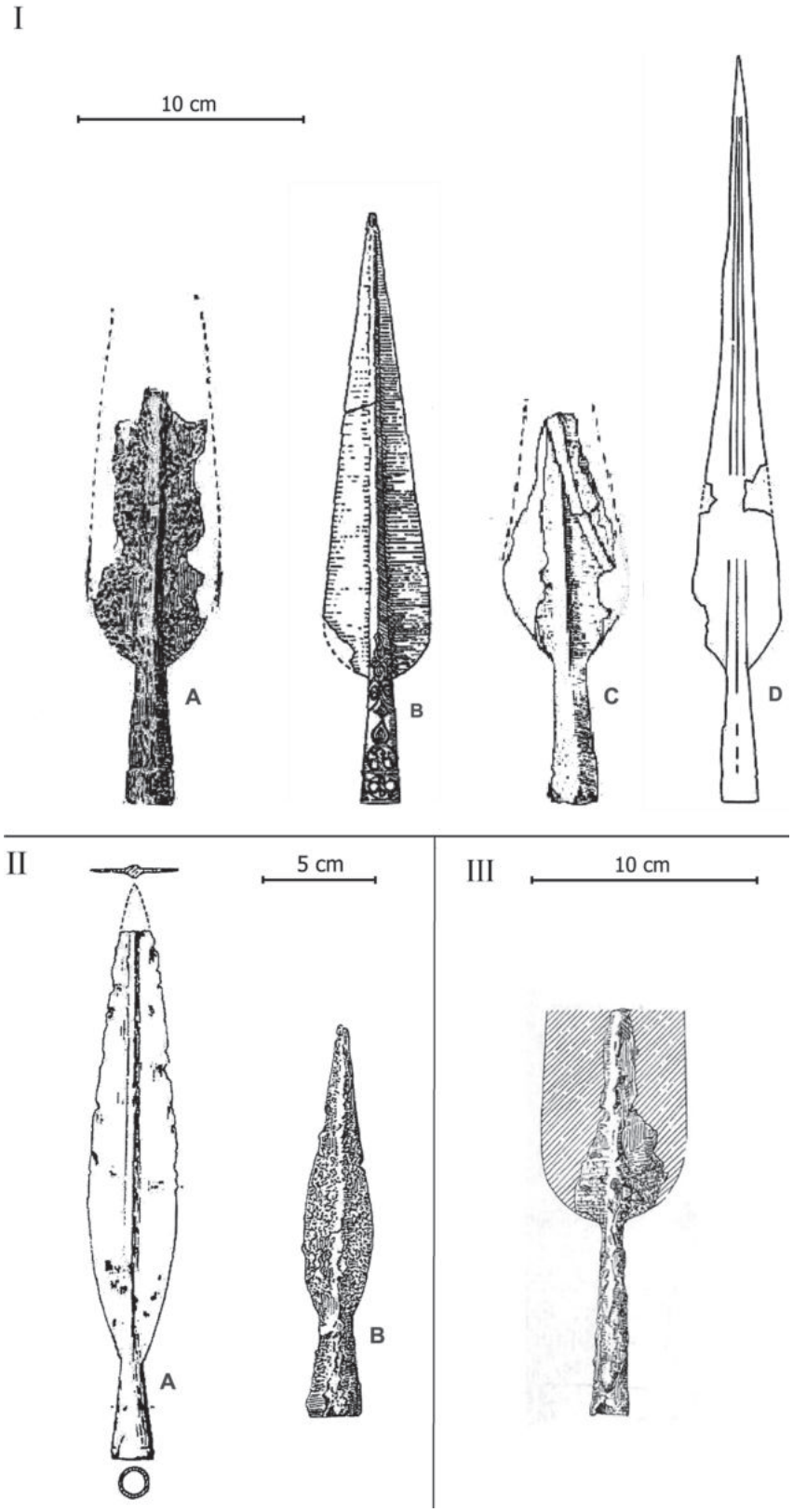

Fig. 7. Spearheads of group I: I/A – Głownin, grave 2–3/1904 (after Jahn 1931); I/B – Iwanowice, grave 9; I/C – Iwanowice grave 34 (after Rosen-Przeworska 1946–1947); I/D – Aleksandrowice (after Bochnak 2006); group III: II/A – Sobocisko, grave 1/1952 (after Czerska 1966); II/B – Sobocisko, grave 3/1900 (after Jahn 1931); III – damaged spearhead from grave 1–2/1891 (after Jahn 1931).

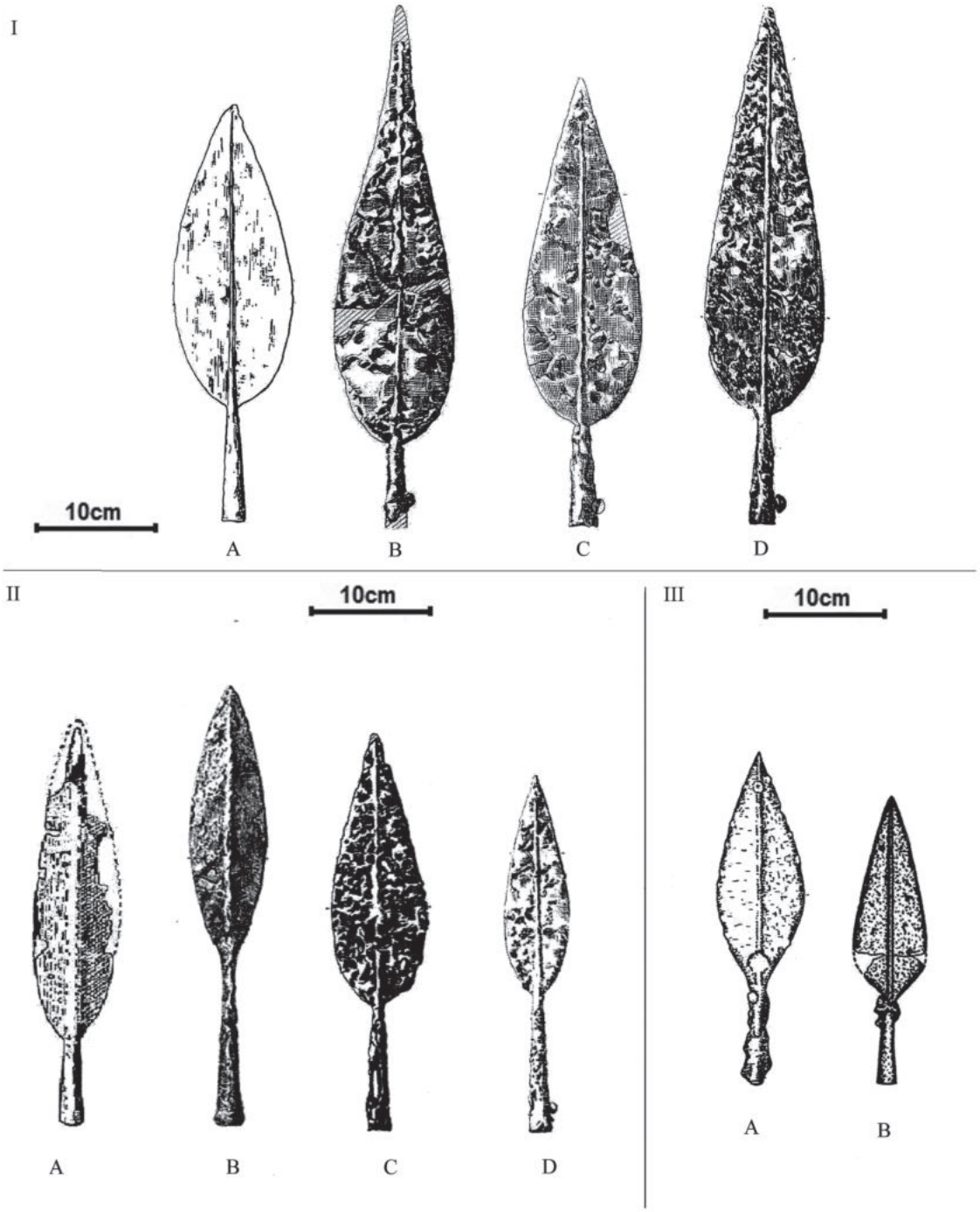

Fig. 8. Spearheads of group IIA : I/A – Sobocisko, grave 3a/1955 (after Czerska 1966); I/B – Sobocisko, grave 24/1940; I/C – Sobocisko, grave 9/1940; I/D – Sobocisko, grave 7/1940 (after Hoffmann 1940); group IIB: II/A – Kraków-Witkowice (after Woźniak 1970); II/B – Sobocisko, grave 1–2/1891 (after Jahn 1931); II/C – Sobocisko, grave 8/1940; II/D – Sobocisko, grave 26/1940 (after Hoffmann 1940); and group IIC: III/A – Kietrz, grave 1701; III/B – Kietrz, grave 1699 (after Gedl 1978).

with a short socket (Fig. 8: I); sub-group IIB – central placed width blade and longer socket (Fig. 8: II); and sub-group IIC – which is created by two specimens from Kietrz graves 1699 and 1701, the smallest spearheads with wide blade (Fig. 8: III).

Group III consists of the spearheads with a narrow blade and a short socket (Fig 7: II). Such specimens are known from grave 1/1952 (Fig 7: II/A) and 3/1900 (Fig 7: II/B) in Sobocisko.

Group IV consists of two spearheads with an exceptional shape and length which prompted the researcher to separate them from the previously mentioned finds. The most visible criteria was the total length and especially the length of the sockets.

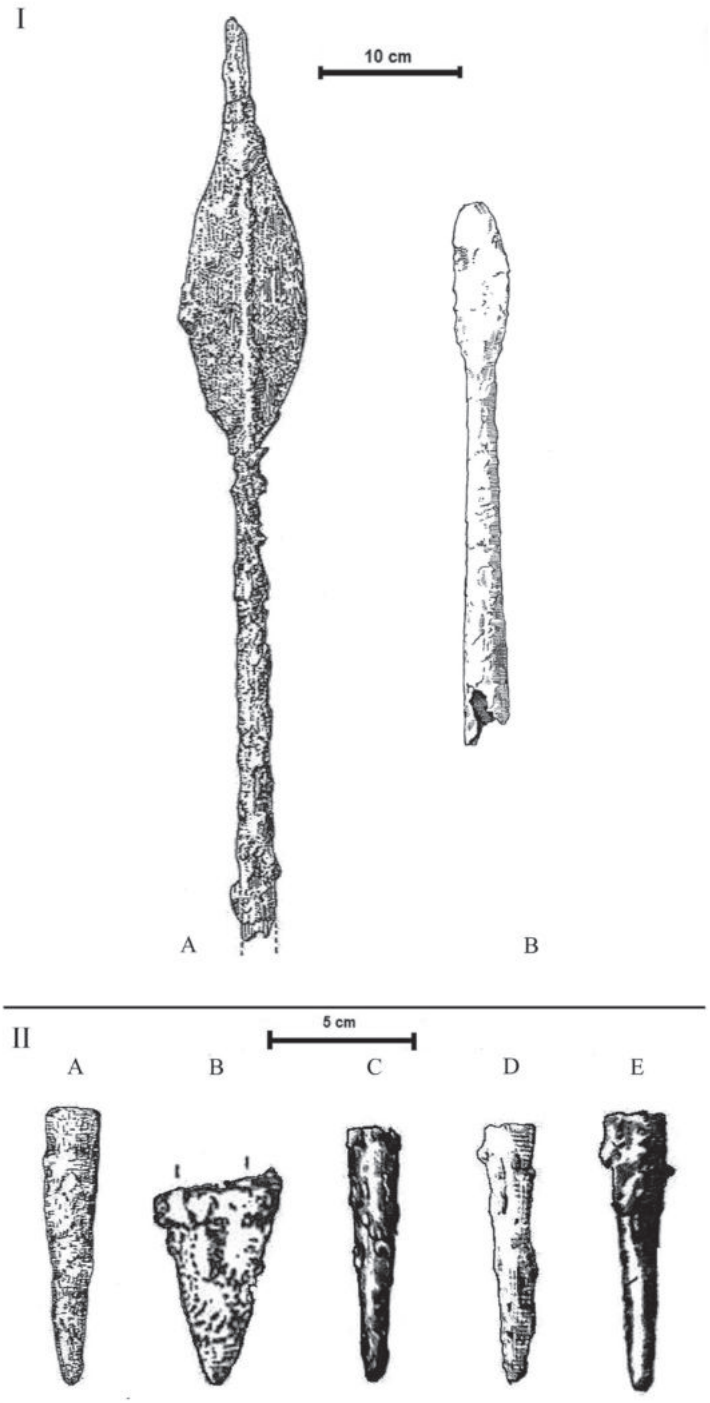

Fig. 9. Spearheads of group IV: I/A – Głownin, grave 1/1930 (after Jahn 1934); I/B – Smolec (after Jahn 1931). Spear-butt caps: II/A – Kietrz, grave 1701 (after Gedl 1978); II/B – Głownin, grave 1/1930 (after Jahn 1934); II/C – Sobocisko, grave 7/1940; II/D – Sobocisko 9/1940; II/E – Sobocisko, grave 24/1940 (after Hoffmann 1940).

These are the spearheads from grave 1/1030 in Głownin (Fig. 9: I/A) and from grave 1 in Smolec/Karncza Góra (Fig. 9: I/B). The specimens of this construction appeared in Central and Eastern Europe very early. An example would be a spearhead dated to phase LTB1b from grave no. 2 in the cemetery in Stánce, in the Most district of the Czech Republic (Waldhauser 1987, 141, tab. 27: 7). More often, however, they are encountered in graves dating back to the LTB2/C1 and LTC1. The following might serve as examples: burials in Bajč Vlkanovo cemeteries, graves 1 and 5 (Benadik 1960, 393, 395, fig. I: 6; II: 12), Hotin grave 28 (Ratimorská 1981, 56, fig. XXI: 9) both in Komárno district in Slovakia, Horný Kšely, Kolin district of Czech

Republic (Waldhauser 2001, 285), Nový Bydžov, Hradec Králové Region of the Czech Republic (Filip 1956, fig. XXII: 6). The spearhead from the Galliš-Lovačka settlement in southwestern Ukraine is a very good analogy to the spearhead from Smolec/Karncza Góra (Kobal 1995–1996, 147, fig. 3: 1). Another two spearheads have been found in Poland, one in the grave discovered in Wiązów (Kosicki 1996, 276) and one in Sobocisko, group 5/1908. Unfortunately, nothing more can be said about the specimens from Wiązów and the loss of materials from Sobocisko (Woźniak 1970, 288). Moreover, the fragmented preservation of the second spearhead from the grave 1–2/1891 in the Sobocisko cemetery (Fig. 7: III) precludes an accurate analysis.

Other individual finds of spearheads are also known from the literature and are mainly from settlements. Such artefacts come from Dalewice, Smroków in Lesser Poland and Smoleń in Upper Silesia (Woźniak 1970, 128, 327, 334, fig. XLVII: 1; Bochnak 2005, 127). From the Celtic cemetery in Sobocsko are a further two examples which were found in object X/1965 (Woźniak 1970, 291). One small spearhead also comes from the Celtic cult place on the top of Ślęża Mountain in Lower Silesia (Petersen 1937, 271, fig. 1; Woźniak 1970, 291). However, the abovementioned spearheads are not included in the study because of their uncertain context, unknown chronological associations and cultural affiliation (Bochnak 2005, 17, 236, 240, 243). There is a suspicion that some of them are associated with the Przeworsk culture and medieval populations.

Metal spear butt caps

Celtic metal spear butt caps covering the end of the shaft were a supplement to a spearhead (Kontny 1999). The number of such butt caps found in Celtic graves amounted to five (Tab. 7) and all had the form of a socket. Three were found in the graves 7/19409, 9/1940, 24/1940 (Fig. 9: II/C, II/D, II/E) in Sobocisko, one was in the grave 1/1930 in Głownin (Fig. 9: II/B) and a last one in grave 1701 from Kietrz (Fig. 9: II/A). The socket type of spear butt cap is most popular in the territories of Central and Eastern Europe and dominated from the early phase of the La Tene period until the late.

Shields

Another artefact often discovered in Celtic warrior graves in Poland are metal elements from the construction of a shield. The most frequent examples are the rims from the middle of the shield. These elements were found in eight graves: two in Kietrz and six in Sobocisko (Tab. 8). The edge rims of the shield were found also in eight graves: four in Sobocisko, two in Kietrz and single graves from Głownin and Iwanowice (Tab. 9).

Another element of the Celtic shield was a handle used to keep and operate a shield (Fig. 10: I; Tab. 10). Five artefacts representing two groups of handles: B and C, according to the typology of Domaradzki, have been found (Domaradzki 1977, 65; Fig. 10: I).

It seems that in the source publication the shield handle from grave 9/1940 in Sobocisko was described incorrectly. Hoffmann considered the highly corroded fragments to have been a boss for the parts of shield handle (Hoffmann 1940, 16, fig. 8: 6). However, the two squarish in shape metal plates with dimensions of 5.5 x 5.5 cm can be recognized as components of the shield handle (Fig. 10: IA), while three more (one square and two rectangular) as boss components (Fig. 10: IIA). Two cupular fittings argue in favour of such an interpretation as they are the front part of mounting the shield handle together with the iron rivets stuck in them (Fig. 10: I/A1, I/A2). Such a rivet passing through the wooden shield also went

Table 7. Metal spear butt caps from the La Tène culture sites in Poland.

Locality	Grave	Length in cm	Diameter of hole in socket in cm	Literature
Głownin	1/1930	6.8	3.7	Jahn 1934, fig. 15: 2
Kietrz	1701	9.5	2	Gedl 1978, fig. VIII: 10
Sobocisko	7/19409	9.5	2	Hoffmann 1940, fig. 3: 8
	9/1940	9	1.8	Hoffmann 1940, fig. 8: 5
	24/1940	10	2	Hoffmann 1940, fig. 12: 13

Table 8. Rims from the middle of the shield from the La Tène culture sites in Poland.

Locality	Grave	Width in cm	Total length in cm	No. of elements	Literature
Kietrz	1699	0.7–0.8	155	45	Gedl 1978, fig. VI: 10
	1701	0.5	67	23	Gedl 1978, fig. VIII: 13
Sobocisko	7/1940	0.8	54.5	13	Jahn 1931, fig. 7: 6
	8/1940	1	41	6	Hoffmann 1940, fig. 8: 4
	9/1940	0.8	72	21	Hoffmann 1940, fig. 8: 6
	24/1940	0.9	50	12	Hoffmann 1940, fig. 12: 12
	26/1940	0.7	108	24	Hoffmann 1940, fig. 12: 2
	3a/1955	1	78	18	Czerska 1966, fig. 16: n, r

Table 9. The edge rims of the shields from the La Tène culture sites in Poland.

Locality	Grave	Width in cm	Total length in cm	No. of elements	Shape of shield	Literature
Głownin	1/1930	1	56	3	Round?/Oval?	Jahn 1934, fig. 15: 6
Iwanowice	9	-	27	3	Oval	Rosen-Przeworska 1946–1947, fig. 13: 14
Kietrz	1699	0.7	1.43	45	Oval	Gedl 1978, fig. VI: 8
	1701	0.5–0.6	2.36	47	Oval	Gedl 1978, fig. VIII: 12
Sobocisko	24/1940	0.7	2.68	62	Oval?	Hoffmann 1940, fig. 12: 12
	26/1940	0.7	-	-	Oval	Hoffmann 1940, fig. 12: 2
	1/1952	0.3–0.6	66	-	Rectangular?	Czerska 1966, fig. 4: o
	3a/1955	0.6	199.5	70	Oval	Czerska 1966, fig. 16: i, l

Table 10. Shield handles from the La Tène culture sites in Poland.

Locality	Grave	Preserved length in cm	Widht of plates in cm	Type (after Domaradzki 1977)	Notes	Literature
Kietrz	1701	14	4	B	Whole	Gedl 1972, fig. VIII: 11
Sobocisko	7/1940	9	5	C	In fragments	Hoffmann 1940, fig. 3: 5
	9/1940	-	5.5	B	In fragments	Hoffmann 1940, fig. 8: 6
	1/1952	2.5	5.4	C	Only plate	Czerska 1966, fig. 4: a
	3a/1955	20	6.5	C	Whole	Czerska 1966, fig. 16: z

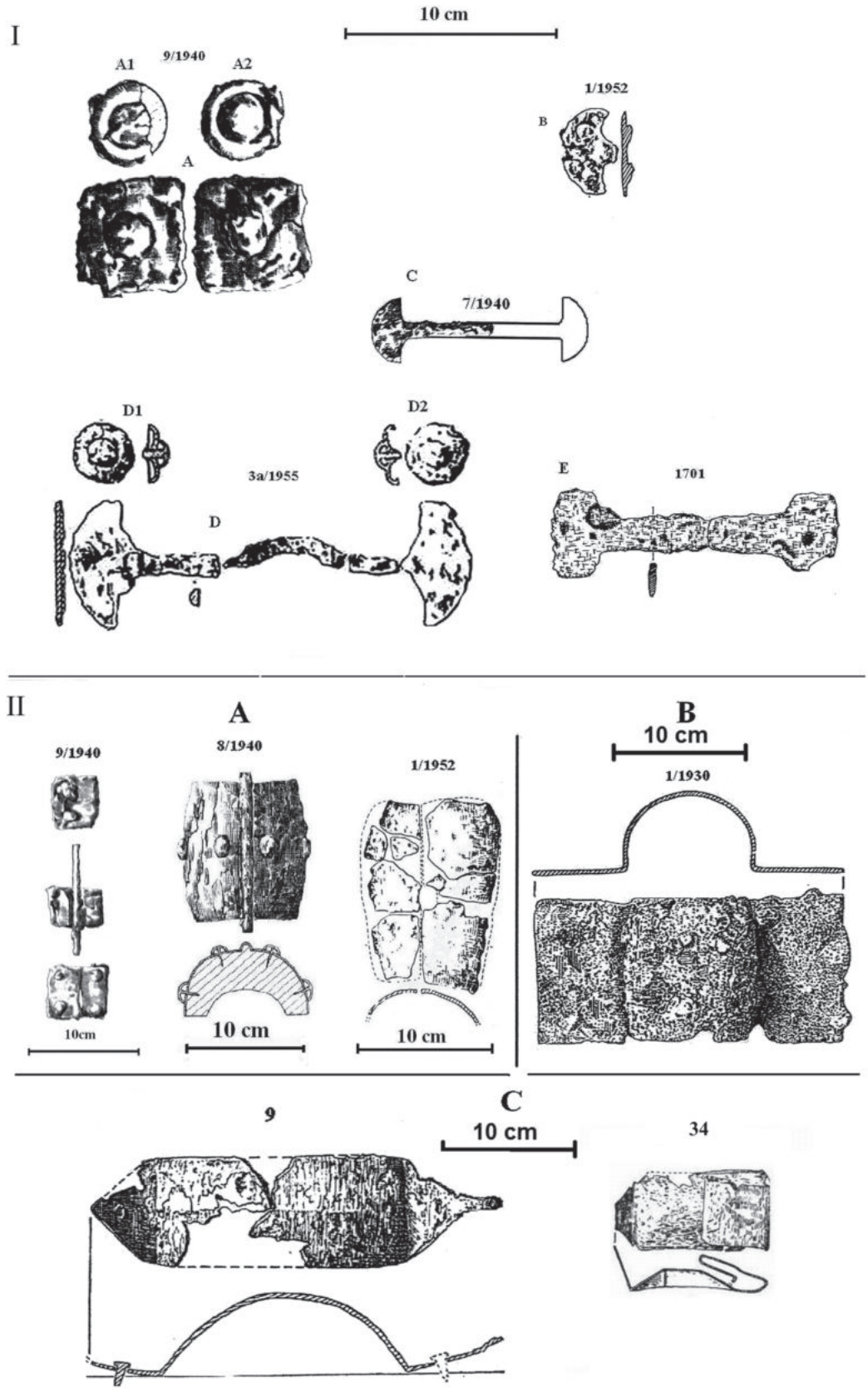

Fig. 10. Metal shield elements.

Shield handles: I/A–D – Sobocisko (after Hoffmann 1940; Czerska 1966); I/E – Kietrz (after Gedl 1978). Shield bosses: II/A – Sobocisko (after Hoffmann 1940; Czerska 1966); II/B – Głownin (after Jahn 1934); II/C – Iwanowice (after Rosen-Przeworska 1946–1947).

through the discs of a shield handle. A similar solution can be observed on the shield from grave 3a/1955 in the same cemetery (Fig. 10: I/D1, I/D2). It seems that the shield handle from the grave 9/1940 might be of the type B according to Domaradzki. One of the remaining discs has a fitting of the middle rib shield attached to its surface, and this would suggest that it is the structural fragment of an umbo, rather than a shield handle. In the source publication, the shield handle from the grave 1/1952 (Fig. 10: I/B) was also unnoticed and interpreted as a crescent fitting probably connected with the sword sheath (Czerska1966, 90). However, the shape of the specimen calls for recognizing this element as part of the shield handle. It is identical with the forms of the shield handle discs from graves 3a/1955 and 7/1940 from the same site. This interpretation is supported by the fact that it was located in the grave next to an umbo and a cupular fitting which is described as a fitting on top of the shield boss.

The most characteristic element of the Celtic shield was its metal boss. Among these artefacts found in Poland, there are two types of shield bosses (Tab. 12). The first type – two-part bosses of the group I A according to Domaradzki's typology (1977, 56–57; cf. Fig. 10: II/A) – were discovered in graves 8/1940, 9/1040 and 1/1952 in Sobocisko. The second type, band-shaped shield bosses, can be divided into two sub-types. The band-shaped item with rectangular wings represents the type II 1A by Domaradzki (1977, 58), similar to type 1b in the typology of bosses found in Gournay-Sur-Aronde in France (Brunaux and Rapin 1988, 79) and was found in grave 1/1930 in Grownin (Fig. 10: II/B). And the band-shaped with triangular wings ended with a narrow point bosses of type II1Dbγ by Domaradzki (1977, 60–61) correspond to type IIIA from Gournay-Sur-Aronde (Brunaux and Rapin 1988, 80) and were discovered in graves 9 and 34 in Iwanowice (Fig. 10: II/C).

Also, the rivets used for the construction of shields were found in four graves in Poland, namely in Kietrz and Sobocisko (Tab. 11).

All of the aforementioned shield elements are an accurate reflection of the situation with prevailed at

Table 11. Rivets form shield construction from the La Tène culture sites in Poland.

Locality	Grave	Diameter of rivet head in cm	Length in cm	No. of elements	Literature
Kietrz	1699	1.3–2	1.1–1.9	7	Gedl 1972, fig. VI: 11–17
	1701	1.4–1.7	-	7	Gedl 1972, fig. VII: 14–24
Sobocisko	1/1952	1.5–2.9	0.6–0.9	5	Czerska1966, fig. 4: g–j
	3a/1955	1.1–1.5	0.5	6	Czerska1966, fig. 16: e, m, o, p, u

Table 12. Shield bosses from the La Tène culture sites in Poland.

Locality	Grave	Type (after Domaradzki 1977)	Height in cm	Width in cm	Literature
Głownin	1/1930	II 1A	11	22	Jahn 1934, fig. 15: 5
Iwanowice	9	II 1Dbγ	8	Preserved 30	Rosen-Przeworska 1946–1947, fig. 12, tab. III: 8
	34	II 1Dbγ	5.5	Preserved 22	Rosen-Przeworska 1946–1947, fig. 7, tab. III: 7
Sobocisko	8/1940	Two-part bosses group I A	11	7	Hoffman 1940, fig. 5
	9/1940?	Two-part bosses group I A	-	-	Hoffman 1940, fig. 8: 6
	1/1952	Two-part bosses group I A	14.5	10.4	Czerska 1966, fig. 4: k

that time in the whole of Central Europe. They are similar to finds from areas of Slovakia and the Czech Republic and are very common in La Tène culture.

Table 13. Chronology of weaponry from La Tène culture sites in Poland.

Locality	Type of find	Dating
Aleksandrowice	Grave	LTC1b
Głownin	Grave 2–3/1904	LTC1
	Grave 4/1927	LTB/C?
	Grave 1/1930	LTB2/C1
	Grave 6/1930	LTB2/C1
Iwanowice	Grave 9	LTC1b
	Grave 34	LTC1b
Kietrz	Grave 1699	LTB2a
	Grave 1701	LTB2a
Kraków-Pleszów	Alleged grave	LTB2/C1a
Kraków-Witkowice	Grave	LTC1
Kraków-Wyciąże	Alleged grave	LTB/C?
Podgaj	Grave	LTB1
Rzeszów	River find	LTC1a
Smolec	Grave 1	LTB1
Sobocisko	Grave 1–2/1891	LTB
	Grave 3/1900	LTB
	Grave 5/1908	LTB
	Grave 7/1940	LTB2a
	Grave 8/1940	LTB2a
	Grave 9/1940	LTB2b
	Grave 24/1940	LTB2a
	Grave 26/1940	LTB1b/B2a
	Grave 1/1952	LTB2b
	Grave 3a/1955	LTB2a
Wiązów	Grave	LTB1

Chronology of the Celtic warrior burials from Poland

Not as many Celtic military graves are known from Poland as from the neighbouring areas of the Czech Republic or Slovakia. However, the time span of the finds is quite considerable. The proposed chronology of the individual sites and entire inventories is based on the chronological system for Polish territories proposed by Zenon Woźniak (1970; 1979, 1992). It has been correlated based on the chronological systems proposed for the neighbouring areas of Moravia (Čižmář 1975), Czech Republic (Waldhauser 1987; 2001), and Slovakia (Bujna 1982; 1991, 2003).

Among the oldest artefacts are: the spearhead found in grave 1 in Smolec and the weaponry preserved in the burial of a warrior from Wiązów. Both features are dated to the phase LTB1 (Woźniak 1970, 57; 1979, 213; Kosicki 1996, 276).

The turn of phases LTB1/B2a may be represented by the inventory of grave no. 26/1940 in Sobocisko. In my opinion, this grave has the oldest set of weapons that can be seen in this cemetery. An important element of its equipment were the sword-belt rings which have the earliest chronological position. Examples of phase LTB2a are the artefacts from graves no. 1699 and 1701 in Kietrz and from the graves no. 7/1940, 8/1940, 24/1940, 3a/1955 in Sobocisko. Such a dating may be justified by the fact that in these graves are such elements of weaponry as: younger forms of sword-belts rings and smaller two-piece shield boss. This also is confirmed by the iron fibula from the grave 3a1955 in Sobocisko. It seems that it represents type A3 by Bujna (2003, 48, 64–65), and is dated on period LTB2a (Bujna 2003, fig. 62, 64).

Weaponry originating from phase LTB2b was found in graves no. 9/1940 and 1/1952 in the cemetery in Sobocisko. As Raftery suggests, the inventory of the grave no. 1–2/1891 from Sobocisko could also be assigned to the same period based on the chronology of the bronze ring of the sword-belt found in this grave (Raftery1988, 6).

Most of the objects discovered in the graves of the cemetery in Głownin can be dated to this phase, with the suggestion that some of them have LTB/LTC1 associations. These representatives are the graves no. 1/1930 and 6/1930. In the inventory of grave 1/1930 were finds such as the *Fuchsschwanzketten* chain belt and a band-shaped shield boss. In the case of the second grave, the chronology can be designated by the suspension-loop of a sword scabbard. A similar date has been ascribed to the analogical suspension-loops found on sword scabbards from such cemeteries as Malé Kosihy in Slovakia, Somogytúr in Hungary, and Ceretolo in Italy (Krämer 1985, 41–43; Bujna 1995, 262; Németh and Szabó 1999/2000, 264–265).

The items from the so called graves no. 2–3/1904 in Głownin are unquestionable examples dating to the middle La Tène Period, i.e. the phase LTC1a. Such a dating may be justified by the dimensions and morpho-

logical characteristics of swords from this grave. Also, the alleged inventory from Krakow-Pleszów is assigned to this phase, however, according to Poleska, it can also be dated to an earlier period (Poleska 2006, 160). Similarly, the sword from Rzeszow is also dated to the LTC1a (Woźniak 1996, 11; Łuczkiewicz 2006, 46).

The subsequent period LTC1b is represented by the artefacts from both graves in Iwanowice (Woźniak 1991, 178). The author also thinks that the grave from Aleksandrowice can presumably be dated to the same period.

According to Woźniak, one of the latest artefacts is the spearhead from Krakow-Witkowice and this should be dated to LTC2 (Woźniak 1970, 128, 327). In this case such a precise dating is doubtful, especially when compared with the greater quantity of similar finds from the previous LTC1 period.

Unfortunately, nothing precise can be said in terms of dating the Sobocisko swords from graves 3/1940 and 5/1908. The only conclusion which can be made is to date the specimen from Sobocisko to approximately the LTB, just as the majority of graves from this cemetery. Although the information on the flat section of the blade sword from grave 3/1940 might suggest it dates back to the Middle La Tene period, it is also obvious that the lack of a rib might have been caused by corrosion. Due to the poor state of preservation of the sword from grave 4/1927 in the cemetery in Głownin, it is also impossible to draw any accurate chronological conclusions. The specimen from Kraków-Wyciąże, which originally came from the surface of the La Tène culture settlement, can probably also only be generally dated to the La Tène period (Poleska 2006, 159).

Conclusions

The first Celtic weapons appeared in what is now Poland as examples of weaponry types widely known throughout Central Europe. Presumably, the first specimens characteristic for the early La Tène culture reached Poland together with the representatives of this culture arriving from Bohemia and Moravia or even further territories on the Danube in the northern parts of Lower Austria (Woźniak 1970, 103–104, 187–188; 1979, 209; Bednarek 2005, 179; Bochnak 2006b; 2007; Dulęba 2009; 2019, 384–385). These consist of the warrior burials in Smolec (Karncza Góra) (grave no. I), Wiązów and Sobocisko (grave no. 26/1940, one of the oldest graves). The artefacts from those are dated to the phases LTB1–LTB2a. The number of finds increases in the subsequent phase, i.e. LB2b. These include most of the graves from the largest cemetery in Sobocisko as well as two warrior's graves in Kietrz. At the same time, the first settlers of La Tène Culture arrived near Kraków (Dulęba 2009; 2014; 2019; Poleska 1996, 212; 2006; Woźniak 2004, 48). The next chronological phase, i.e. LTB2/LC1, was marked by the weaponry characteristic for the middle La Tène Period. A new wave of migration probably came from Moravia (Dulęba 2014, 189–192). It is possible to notice increasingly frequent contact between the Moravian Celtic population with those from the surroundings of the Danube and southern areas, reaching Slovenia and even northern Italy (Čižmář 2005, 132). During this time, new types of weaponry started to arrive in Poland. It is not only noticeable in the territories of Silesia but also near Kraków (Woźniak 2004, 52). A long spearhead discovered in the grave no. 1/1930 in the cemetery in Głownin has some indirect counterparts in the Czech Republic, Moravia and Slovakia. As an example, we would offer a specimen dated to phase LTB1b from the Stránce graveyard in Czech Republik (Waldhauser 1987, tab. 27: 7). This type of spearhead is more common in LTC, such dated artefacts came from the cemetery in Bajč Vlkanovo grave 1 and grave 5 in Slovakia (Benadik 1960, tab. I: 6; II: 12), Horný Kšely (Waldhauser 1987, fig. 3: 44; 2001, 285), Nový Bydžov (Filip 1956, tab. XXII: 6) in the Czech Republic and Dražúvki grab from 1933 in Moravia (Čižmářova 2004, 171–172).

A similar case is another spearhead found in the same location, in grave no. 2–3/1904. This artefact could possibly have the same shape as the spearheads from Iwanowice (graves nos. 9 and 34 – type 1) and Aleksandrowice. Apart from the shape, another prompt suggesting the origins of these artefacts is the ornament of the specimen from Iwanowice. The middle La Tène culture is assigned to the graves from Iwanowice and the southern origins of this weaponry were mentioned several times in the literature (Woźniak 1970, 107–109; 2004, 52). Another example of the influence of La Tène culture in the Carpathian Basin is the chain sword-belt from Głownin, discovered in grave no. 1/1930 which has counterparts in Moravia, Slovakia and up to the lands of Serbia (Filip 1956, 170–171; Woźniak 1970, 59, annotation 53) At the same cemetery in Głownin another three interesting specimens were discovered. One of them is the decorated fragment of the chain belt from grave no. 2–3/1904. Based on this decoration, it may be supposed that the belt is of southern origin. As mentioned before, a close counterpart may be found in the cemetery in Brežice, Slovenia – the same place as

another counterpart for the belt from Aleksandrowice was found. The southern influence in the middle La Tène culture is substantiated by the weaponry found near Kraków. Apart from the inventory of two graves from Iwanowice, the finds from Aleksandrowice play an important role here, especially the warrior's decorative belt.

This proves the strong connections between these two spheres of the Celtic world. This fact may also suggest that the warrior from Aleksandrowice might have been of southern origin. It is also possible that the intensive arrival of the middle La Tène culture weaponry might have been the result of Celtic migrations. As it is widely known, during this time the territories of the Carpathian Basin witnessed strong Celtic settlement occupying new terrain (Woźniak 2004, 48). Further proof of this Celtic migration from the south to the north is the sword from Rzeszów, which arrived here presumably by the Trans-Carpathian way (via the mountain passes of Bieszczady and Low Beskids) towards the settlement area on the San River (Woźniak 2004, 49–52). It is possible that this artefact came with the first Celtic settlers who arrived in the territories of Podkarpacie during the phase LTC1 (Olędzki 2005, 148; Karwowski 2008).

As already mentioned, some essential changes were introduced to burial traditions at the end of the LTC1b phase. As a consequence, Celtic graves disappeared completely from the archaeological record. However, this does not mean the disappearance of Celtic weaponry from archaeological sites, it only changes its character. Celtic weaponry started to occur as imported elements in the burial inventories of the Przeworsk and Oksywie Cultures (Woźniak 1970, 157–160; Dąbrowska 1988, 134–135; Bochnak 2005, 126–127; Łuczkiewicz 2006, 359–361). The oldest artefacts connected with the beginning of Przeworsk culture are long swords in their scabbards with engraved ornamentation from Brzozówka, grave no. 3 and from Warszawa-Żerań (Rosen-Przeworska 1939–1945; Woźniak 1970, 157; Dąbrowska 1988, 134–135; Łuczkiewicz 1997; 2006, 181; Tomaszewska 1997; Bochnak 2005, 38, 41–43, 156). Recently, this group of artefacts was extended by a find from an unknown location in Mazovia. M. Biborski and P. Kaczanowski (Biborski and Kaczanowski 2010) write about the region of the La Tène culture appropriate for the specimen from Mazovia, but they cite various counterparts originating from the Carpathian Basin. Also, the eastern territory of the Celtic culture had workshops that could have produced the swords from Brzezówka and Warszawa-Żerań.

There is a relatively small number of weapons that can be associated with the La Tène culture settlement in Poland. They are, however, so diverse that one can conclude that the local Celtic warriors kept up to date with the ever-changing military fashions, drawing not only on the geographically closest models but from European areas much further afield as well.

Catalogue

1. Aleksandrowice, Kraków county, Małopolskie voivodeship

Grave without the number (a lone Celtic grave): cremation
Weaponry:
- an iron sword: the total length 90 cm, length of the handle 11 cm, width of the blade 4.2 cm,
- the two pieces of the iron scabbard,
- an iron spearhead (group I): length 39 cm, max width of the blade 5 cm, length of the socket 7 cm, the diameter of the socket hole 2 cm.

Dating: LTC1b
Literature: Naglik 2001, 318; Bochnak 2005; 2006a, 167, fig. 7–8.

2. Głownin, Strzelin county (former Germ. Glofenau, Kreis Nimptsch), Dolnośląskie voivodeship

So called grave 2–3/1904: cremation
Weaponry:
- the two long iron swords: length of both specimens 81 cm, length of the handles 11 cm, width of the blades 4 cm,
- the fragments of decorated iron sword chain belt (type Rapin 7), with double twisted links, preserved length 7.5 cm,
- the fragment of iron spearhead (group I).

Dating: LTC1a
Literature: Jahn 1931, 50–51, fig. 45.

Grave 4/1927: inhumation?
Weaponry:
- the fragment of an iron sword in a scabbard.

Dating: LTB2/C1?
Literature. Jahn 1931, 110.

Grave 1/1930: inhumation in a flat position with head towards north
Weaponry:
- an iron sword in a scabbard: total length 65 cm, width 5.5 cm,

– the fragments of iron chain belt (type Rapin 6): preserved length 45 cm,
– an iron spearhead (group IV): length 60 cm, width of the blade 8.5 cm, length of the socket 31.4 cm, the diameter of the socket hole 2.5 cm,
– spear butt cap: length 6.8 cm, the diameter of the hole 2.5 cm,
– the iron band-shaped boss with rectangular wings type II1A: length 22 cm, height 11 cm,
– the iron shield edge protection pieces: width 1 cm, total length 50 cm.

Dating: LTB2/C1
Literature: Jahn 1934, 120–122, fig. 15.

Grave 6/1930: inhumation?
Weaponry:
– an iron sword in a scabbard: the preserved length 65.8 cm,
– the fragment of iron chain belt (type Rapin 3): preserved length 9 cm.

Dating: LTB2/C1
Literature: Jahn 1934, 123–124, fig. 19, 21.

3. Iwanowice, Miechów county, Małopolskie voivodeship

Grave 9: cremation
Weaponry:
– iron sword: length 72.5 cm, length of the handle 11.8 cm, width of the blade 4.7 cm,
– fragments of an iron scabbard,
– the iron spearhead with decorated socket (group I): length 28 cm, width of the blade 3 cm, length of the socket 5.8 cm, the diameter of the socket hole 2 cm,
– the fragments of the so-called armoured iron sword chain belt (type Rapin 8): the longer part length 44 cm, shorter part length 13 cm,
– the iron band-shaped shield boss with triangular wings: length 30 cm, max width 8 cm,
– the iron shield edge protection elements: total length 27 cm.

Dating: LTC1b
Literature: Kozłowski 1912, 25; Rosen-Przeworska 1946–1947, 185–190, fig, 9–14, tabl. I: 1, 3; II: 5, III: 8–11; IV: 13–16.

Grave 34: cremation
Weaponry:
– iron sword: length 60 cm, length of the handle 11 cm, width of the blade 5.2 cm,
– fragments of iron sword scabbard,
– the iron spearhead (group I): length 32.5 cm, max width of the blade 5 cm, length of the socket 6.8 cm, the diameter of the socket hole 2 cm,
– two fragments if iron sword chain belt (type Rapin 7): the total length 22 cm,
– the iron band-shaped shield boss with triangular wings: preserved length 22 cm, max width 5.5 cm.

Dating: LTC1b
Literature: Kozłowski 1912, 25; Rosen-Przeworska 1946–1947, 181–185, fig. 3–5; 7; 9, tabl. I: 2; II: 4, 6; III: 7; IV: 12.

4. Kietrz, Opole county, Opolskie voivodeship

Grave 1699: inhumation in a flat position, head towards north-west
Weaponry:
– the iron sword in the scabbard: preserved length 67 cm, width in the scabbard 5 cm,
– the iron spearhead (type IIC): length 24 cm, width of the blade 8.6 cm, length of the socket 8 cm, the diameter of the socket hole 1.8 cm,
– two hollow inside sword belt rings: the external diameter of the survived one is 3.8 cm; one ring is made from a 0.5 cm thick uniform iron bar, the external diameter is 2.5 cm,
– the iron middle shield spine protection elements: total length 155 cm, width 0.7–0.8 cm,
– the iron edge shield protection elements: total length 143 cm, width 0.7 cm,
– seven iron rivets from the shield construction.

Dating: LTB2a
Literature: Gedl 1978, 16–17, tabl. 6.

Grave 1701: inhumation in a flat position, head towards north-west
Weaponry:
– iron sword in a scabbard: length 73 cm, length of the handle 12 cm, width with the scabbard 4.4 cm,
– the iron spearhead (type IIC): length 26 cm, width of the blade 7.2 cm, length of the socket 8 cm, the diameter of the socket hole 1.5 cm,
– the iron spear butt cup: length 9.5 cm, the diameter of the butt cup hole,
– tree hollow inside sword belt rings: external diameter 3.5 cm, internal whole diameter 1.2 cm,
– iron shield handle with superrich plates: length 14 cm, width of the plates 4 cm,
– iron middle shield spine protection elements: total length 67 cm, width 0.5 cm,
– iron edge shield protection elements: total length 236 cm, width 0.5–0.6 cm,
– ten iron rivets from the shield construction.

Dating: LTB2a
Literature: Gedl 1978, 36–40, tabl. 8.

5. Kraków-Pleszów, Kraków county, Małopolskie voivodeship

Alleged grave
Weaponry:
– fragment of an iron sword: width of the blade 5 cm,
– the iron sword chain belt (type Rapin 7): preserved length 22 cm.
Dating: LTB2b/C1a
Literature: Poleska 1996, 213, 216; 2006, 159–160, fig. 22: 2, 3.

6. Kraków-Witkowice, Kraków county, Małopolskie voivodeship

Grave 1: cremation
Weaponry:
– the iron spearhead (group IIB): length 37 cm, max width of the blade 7 cm, length of the socket 10 cm, the diameter of the socket hole 2 cm.
Dating: LTC2
Literature: Woźniak 1970, 128, 327, tabl. XLVII.

7. Kraków-Wyciąże, Kraków county, Małopolskie voivodeship

Alleged grave
Weaponry:
– the fragment of a so-called iron sword: width of the blade 5 cm, length of the handle 15 cm.
Dating: LTB/C
Literature: Poleska 2006, 159, fig. 22: 1.

8. Podgaj, Strzelin county (former Jezierzyce Małe, Germ. Klein Jezeritz, Kreis Strehlen), Dolnośląskie voivodeship

Grave: inhumation in a flat position
Weaponry:
– the iron spearhead.
Dating: LTB1
Literature: Dulęba 2019, 381.

9. Rzeszów, Rzeszów county, Podkarpackie voivodeship

Stray find form the bottom of the Wisłok River
– the iron sword in the scabbard: length 77.5 cm, length of the handle 12 cm, width of the blade 5.4 cm.
Dating: LTC1a
Literature: Kunysz 1962, 86–87; Łuczkiewicz 1997; 2006a, 46; 2006b, 168–169, fig. 3.

10. Smolec, Wrocław county (former Karncza Góra, Germ. Kentschkau, Kreis Breslau), Dolnośląskie voivodeship

Grave 1: inhumation in a flat position
Weaponry:
– the iron spearhead (group IV): length 28 cm, width of the blade 4 cm, length of the socket 18.5 cm, the diameter of the socket hole 2.5 cm.
Dating: LTB1
Literature: Seger 1896; Jahn 1931, 15, fig. 6: 3; Dulęba 2019, 378.

11. Sobocisko, Oława county (former Germ. Zottwitz, Kreis Breslau), Lower Silesia

Grave 1–2/1891: inhumation?
Weaponry:
– the iron spearhead (group II B): length 40 cm, width of the blade 6.5 cm, length of the socket 15 cm, the diameter of the socket hole 2 cm,
– the iron spearhead: preserved length 18 cm, max width 4 cm, length of the socket 8.8 cm,
– the bronze hollow inside sword belt ring.
Dating. LT B2b
Literature: Jahn 1931, 114–116, fig. 7: 2, 4, 6.

Grave 3/1900: inhumation?
Weaponry:
– the iron sword fragment: preserved length 22 cm, width 5 cm,
– short iron spearhead (group III): length 20.5 cm, width of the blade 3.4 cm, length of the socket 5 cm.
Dating: LTB
Literature: Jahn 1931, 114–116, fig. 7: 5, 7.

Grave 5/1908: inhumation (the artefacts are missing)
Weaponry:
– fragment of an iron sword in a scabbard.
– short iron spearhead.
Dating: LTB
Literature: Jahn 1931, 114–116; Woźniak 1970, 288.

Grave 7/1940: inhumation in a flat position with head towards north facing west
Weaponry:
– the iron sword in the scabbard: length 62.5 cm, length of the handle 10.4 cm, width in the scabbard 5.3 cm; seven iron rivets for the organic handle elements,
– the iron spearhead (group IIA) with bronze rivet in the socket: length 44 cm, width of the blade 10.5 cm, length of the socket 9 cm, the diameter of the socket hole 2 cm,

– the iron spear butt cup: length 9.5 cm, the diameter of butt cup hole 2 cm,
– two made from a 0.6 cm thick uniform iron bar sword belt rings: external diameter 3.5 cm, internal diameter 1.5 cm,
– the iron fragmented shield handle with sub-rounded plates: length 9 cm, width of the plates 2 cm,
– the iron middle shield spine protection elements, total length 54.5 cm, width 0.8 cm.

Dating: LTB2a
Literature: Hoffmann 1940, 12–13, fig. 3.

Grave 8/1940: inhumation in a flat position with head towards north facing north-east
Weaponry:
– the iron sword in the scabbard: length 62.3 cm, length of the handle 9 cm, width in the scabbard 5.5 cm,
– the iron spearhead with bronze rivet in the socket: length 36 cm, width of the blade 6.5 cm, length of the socket 13.3 cm, the diameter of the socket hole 2 cm,
– tree bronze hollow inside sword belt rings: external diameter 2.5 cm, thickness 0.8 cm, diameter of the whole 4 cm,
– the two pieces shield boss: length 11 cm, width 7 cm, with four nails in it,
– the iron edge shield protection elements: total length 41 cm, width 1 cm.

Dating: LTB2a
Literature: Hoffmann 1940, 13–14, fig. 5; 8: 1–4.

Grave 9/1940: inhumation in a flat position with head towards south
Weaponry:
– the iron sword in the scabbard: length 68 cm, length of the handle 13 cm, width in the scabbard 5.5 cm; two iron rivets for organic handle elements,
– the iron spearhead with bronze rivet in the socket: length 37 cm, width of the blade 10 cm, length of the socket 8.5 cm, the diameter of the socket hole 2 cm,
– iron spear butt cup: length 9 cm, the diameter of the butt cup hole 1.8 cm,
– tree bronze hallow inside sword belt iron rings: external diameter 3.4 cm, thickness 1 cm, diameter if the whole 1.6 cm,
– the iron fragments of the shield handle with 4 cm wide round plates,
– fragments of an iron shield boss,
– the iron middle shield spine protection, total length 72 cm, width 0.8 cm.

Dating: LTB2b
Literature: Hoffmann 1940, 15–16, fig. 8: 5–12.

Grave 24/1940: inhumation in a flat position with head towards north facing south
Weaponry:
– the iron sword in the scabbard: length 63.5 cm, length of the blade 6 cm, width in the scabbard 6 cm; five iron rivets for the organic handle elements,
– the iron spearhead with bronze nail in the socket: length 38.5 cm, width of the blade 10 cm, length of the socket 6.5 cm, the diameter of the socket hole 2 cm,
– the iron spear butt cup, length 10 cm, the diameter of butt cup hole 2 cm,
– tree iron hallow inside sword belt rings: external diameter 3.5 cm, thickness 0.8 cm, diameter of the whole 0.6 cm,
– the iron middle shield spine protection: total length 50 cm, width 0.9 cm,
– the iron edge shield protection elements: total length 268 cm, width 0.7 cm.

Dating: LTB2a
Literature: Hoffmann 1940, 17–18, fig. 12: 10–13.

Grave 26/1940: inhumation in a flat position with head towards north facing east
Weaponry:
– the iron sword in the scabbard: length 68 cm, length of the handle 8 cm, width in the scabbard 5.3 cm,
– the iron spearhead: length 31.5 cm, width of the blade 7.7 cm, length of the socket 10.5 cm, the diameter of the socket hole 2 cm,
– tree made from a 0.8 cm thick uniform iron bar sword belt rings: external diameter 3.5 cm, internal diameter 2.7 cm,
– the iron middle shield spine protection: total length 108 cm, width 0.7 cm.

Dating: LTB2a
Literature: Hoffmann 1940, 21–22, fig. 12: 1–6.

Grave 1/1952: inhumation in a flat position with head towards northeast, facing west
Weaponry:
– the iron sword in the scabbard: length 63.4 cm, width in the scabbard 3.3 cm; tree iron rivets for the organic handle elements,
– the iron spearhead: length 29.4 cm, width of the blade 4.4 cm, length of the socket 9.5 cm, the diameter of the socket hole 2.1 cm,
– thirty six fragments of iron chain belt (type Rapin 5),
– the fragments of two pieces iron shield buss: length 14.5 cm, width 10.4 cm,

– fragments of iron shield handle with half-rounded plate: preserved length 5.4 cm width of the plate 2.5 cm,
– small iron bole shaped shield application with rivet in the middle,
– five small iron rivets,
– the iron edge shield protection fragments: total length 66 cm, width 0.8 cm.

Dating: LTB2b
Literature: Czerska 1966, 90, fig. 4.

Grave 3a/1955: inhumation in a flat position with head towards north, facing south-west
Weaponry:
– the iron sword in the scabbard: length 70.5 cm, length of the handle 5 cm, width in the scabbard 5.6 cm; tree rivets for the organic handle elements,
– the iron spearhead: length 35 cm, width of the blade 10 cm, length of the socket 9.5 cm, the diameter of the socket hole 2 cm,
– tree bronze hollow inside sword belt rings: external diameter 3 cm, thickness 1 cm, internal diameter 0.3 cm,
– the iron middle shield spine protection: total length 78 cm, width 0.6 cm,
– the iron edge shield protection fragments: total length 199.5 cm, width 0.6 cm,
– six iron rivets from shield construction,
– iron shield handle with half-rounded plats: length 20 cm, width of the plates 6.5 cm.

Dating: LTB2a
Literature: Czerska 1966, 96, fig. 16.

12. Wiązów, Strzelin county, Lower Silesia

Grave 1992: inhumation
Weaponry:
– the iron sword in the scabbard,
– the two iron spearheads.

Dating: LTB1
Literature: Kosicki 1996, 273–279.

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Hooked Pins in the Przeworsk Culture – Typology, Chronology, Distribution and Function

Abstract

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Thanks to the analysis of hooked pins in the Przeworsk culture, a new division of this category was introduced. A new typological classification of the hooked pins was made and their two types (1–2) and their subtypes (A–B) were defined. The article takes into account the territorial and chronological range of their occurrence, from the early Pre-Roman Period to Roman Period and the Migration Period. The function of the hooked pins is also presented.

Keywords: metal tools, pins, spinning, Przeworsk culture

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Introduction

One of the elements of grave equipment in Polish territory during the Roman Period were pins with a twisted or untwisted handle and a hooked head. These artefacts are known in the literature as hooked pins (German: *Hakennadel*, Polish: *szpila hakowa*, *szpila haczykowata* or *zatyczka do przędzy*). They are uncomplicated objects, usually several centimetres long.

Pins with hooked heads attracted the attention of Iron Age researchers relatively early on. Already in 1910 M. von Kimakowicz-Winnicki presented ethnographic analogies and concluded that such items could have served as parts of spindles (von Kimakowicz-Winnicki 1910, 58–64). The most complete study on metal pins is the work of B. Beckmann (1966). This researcher created a typology of metal pins from the areas of Central European *Barbaricum*, distinguishing 10 groups and defining their chronology. However, it should be clearly noted that due to the growth of the source base, this work is becoming increasingly outdated. B. Beckmann classified hooked pins in the sixth group (form numbers 103 and 104) (Beckmann 1966, 33).

In Beckmann's typology, hooked pins belonged to similar objects serving as ornaments or parts of a costume. Although very similar in formal terms, the hooked pins discussed here were most probably tools. Their function has been under discussion for a long time. Even though, as mentioned, M. von Kimakowicz-Winnicki already considered them elements of spindles, this interpretation was not generally accepted. Some researchers considered the hooked pins to be objects for fastening hair, or the shrouds or clothing in which a dead person was wrapped (Beckmann 1966, 7–8; Godłowski 1977, 41). According to R. Laser, the pins in question could have been used to fasten certain parts of light robes used by women (Laser 1987, 48). According to some researchers who dealt with the materials of the so-called Gothic circle cultures, these could have been hair ornament needles or accessories for fastening hair, clothing or the shroud in which the corpse was wrapped (Kmieciński 1962, 78; Kokowski 1993, tab. 116a: 1–26; Wołągiewicz 1995, 41). An original conception was presented by M. Biborski and P. Kaczanowski. Basing on the finding of a pyxis-type wooden casket from the site of the Wielbark culture in Lędyczek, near Złotów, in which remains of a fabric

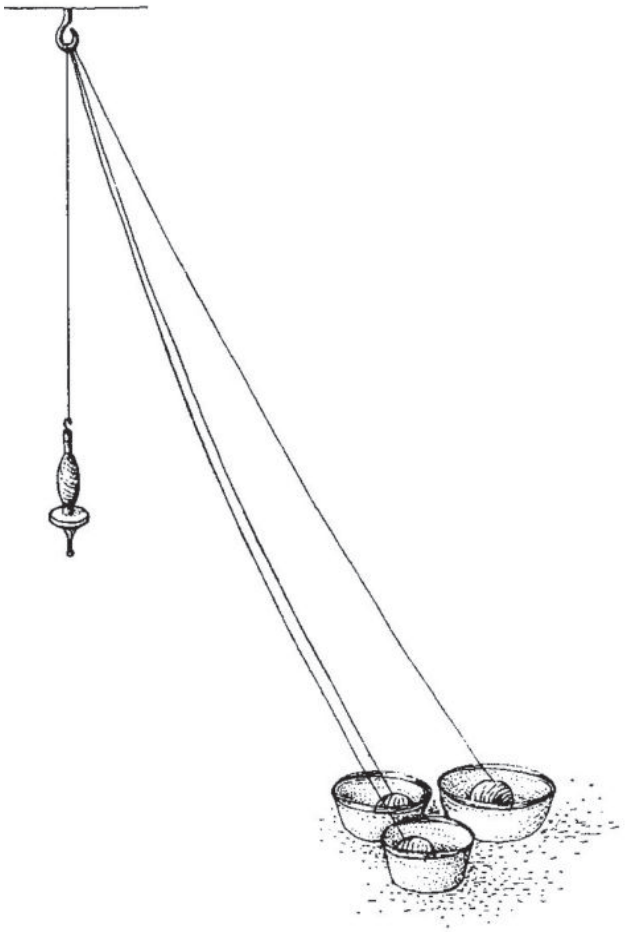

Fig. 1. Hook pin as part of the spindle in 1900, Transylvania (Romania) (after Laser 1987, 51, fig. 2).

with a needle and a hooked pin were found, the researchers assumed that the pins could have been used for fastening, i.e. joining fabric by means of a rare stitch for fitting before sewing garments (Biborski and Kaczanowski 2001, 74). Finds from the Wielbark culture, mainly from the Masłomęcz group, which often occur in the graves of women and children, or from the Chernyakhov culture are of great importance, as they usually come from skeletal graves, where the location of the inventory reflects the intentional arrangement of objects deposited during the funeral ceremony, and in occasional cases it is also possible to preserve fragments of objects from organic substances (Kokowski 1993; Magomedov 2015, 11–12). Next to the hooked pins, wood remnants were sometimes identified, according to A. Kokowski, being the remains of wooden sheaths (Kokowski 2005, 381).

Although there have been numerous attempts to interpret the function of hooked pins from the territory of Central European *Barbaricum* in various ways, it seems that the original concept of M. von Kimakowicz-Winnicki is the most probable (von Kimakowicz-Winnicki 1910, 58–64; Beckmann 1966, 7–8; Godłowski 1977, 41). As mentioned, he assumed that the items in question were parts of spindles. This hypothesis may be confirmed, among other things, by the co-occurrence of hooked pins with spindle whorls in skeletal tombs (Dąbrowska 1974, 232–233; 1997, 99; Godłowski 1977, 41). It is assumed that they were a part of wooden spindles or spinning wheels, and the hooked end of the pin head was used to catch threads and to twist several thinner threads into thicker ones (Dąbrowska 2008, 35). Both ethnographic analogies (Fig. 1; Laser 1987, 48) and examples of archaeological findings from the other periods or cultural circles (Gleba 2008, 103; Chmielewski 2009, 63–65) indicate the use of hooked pins as parts of spindles. Particularly instructive in this respect seem to be the remarks of M. Gleba, who studied textile production on the Apennine Peninsula before the period of domination enjoyed by the Roman Republic. According to the aforementioned researcher, the so-called spinning hooks were an element of spindles. They were supposed to be metal pieces about 5 cm long, which were fixed in a wooden spindle shaft (Gleba 2008, 103). Another argument confirming M. von Kimakowicz-Winnicki's hypothesis is the depiction on a vessel from the Athenian Acropolis (Fig. 2). It shows an object placed in a spindle resembling the head of a hooked pin (Graef and Langlotz 1925, pl. 93). It seems that the hook in the spindle functioned as a support for rolling several thinner threads into thicker ones and for hooking threads. J. Maik came to similar conclusions. This undisputed expert on protohistoric textiles interprets the hooked pins as parts of spindles or, more precisely, plugs to prevent the yarn from slipping off the spindle. According to J. Maik, the aforementioned "sheaths" or "cases" are the remains of wooden spindles (Maik 2012, 57–59).

The hooked pins found in the Przeworsk culture have not yet been the subject of a separate study. K. Godłowski focused on this type of findings while discussing sites from Upper Silesia. The researcher noticed that hooked pins often accompany spindle whorls and are usually found in women's graves (Godłowski 1977, 41). The observations of K. Godłowski's were complemented among others by (Dąbrowska 1997, 99; 2008, 5). However, until now, no attention has been paid to the diversity of these items and whether these differences have a chronological value. Currently, 107 hooked pins from 38 sites of the Przeworsk culture have been published in the literature. The most common are iron specimens (85 examples), but pins made

Fig. 2. Hook pin as part of the Acropolis spindle in Athens (after Graef and Langlotz 1925, fig. 93).

of copper alloys have also been recorded (12 pieces). In the literature, such pins are defined as those made of bronze but this is only a customary term because there are no results from metallurgical analysis in the case of aforementioned artefacts. No information on the material of which they were made is available for 10 pieces. There were 95 examples from cemeteries, 12 are fragmentary findings without context, also from cemeteries.

Typology, chronology and distribution

The classification is based on 97 pins, for which we have information on the raw material from which they were made and their shape (Fig. 3). While analysing the diversity of hooked pins of the Przeworsk culture, a two-stage typology was adopted, i.e. a division into types and subtypes. The primary criterion for distinguishing the types was the metal material from which the objects were made (1 – iron, 2 – copper alloys). It should be noted that the hooked pins are also present in the neighbouring Wielbark culture and

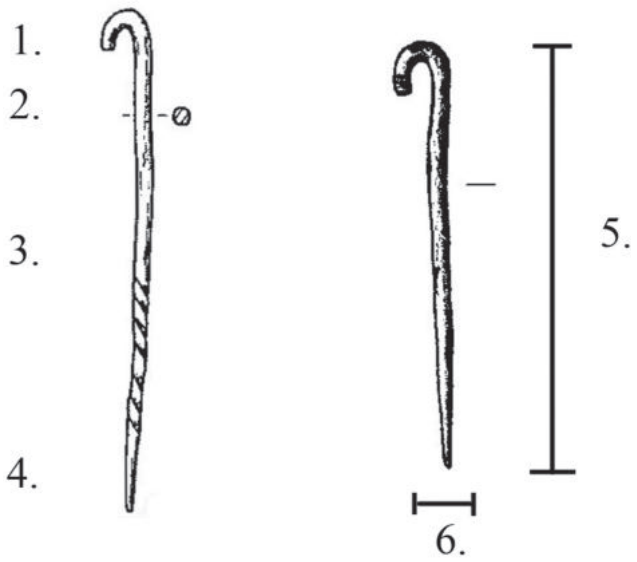

Fig. 3. Basic construction elements and parameters of a hook pin.

1 – head, 2 – neck, 3 – handle, 4 – spike, 5 – length, 6 – width (after Dąbrowska 1997, 213, fig. LXII: 14; Maciałowicz 2010, 374, fig. 9: 4; modified by W. Stącel).

for the most part are made of copper alloys. However, the summary of monuments in Wielbark culture has not yet been presented. The main distinction between this category of artefacts is the raw material, and this is the main criterion of the division adopted in this publication. The secondary features, based on which the subtypes were distinguished, were the form of the shape of the pin shaft, namely the presence (A) or absence (B) of twisting.

Type 1 includes hooked pins made of iron. The length of preserved Type 1 hooked pins varies from 2.5 cm to 7.5 cm. This type is represented by 85 pieces. All type 1 pins come from sepulchral sites, specifically cremation graves. Two subtypes (1.A and 1.B) were identified according to the shape of the handle.

Subtype 1.A (Fig. 4, 5) includes iron hooked pins with a straight, i.e. without any twisting handle and with a twisted head (Fig. 6). Currently 40 examples of subtype 1.A are known and these correspond closest to the examples classified by Beckmann as group VI and numbered 104, this group also includes pins made of bronze and silver (Beckmann 1966, 33) (List of items, Tab. 1).

The hooked pins of subtype 1.A were often found in grave complexes, accompanied by monuments which may indicate the chronological order, among others: in Błonie, gr. 118 – a type K fibula after Kostrzewski (1919) (Mycielska and Woźniak 1988, 71–72, tab. CIC: 2), gr. 189a – a type IA knife, based on the classification used for Błonie grave field (Mycielska and Woźniak 1988, 95–96, tab. CLXVIIA: 2), gr. 216 – a type H fibula after Kostrzewski (1919) (Mycielska and Woźniak 1988, 103–104, tab. CLXXXIIIB: 3), gr. 224 – a type A or B fibula after Kostrzewski (1919) (Mycielska and Woźniak 1988, 105–106, tab. CLXXXVIIIB: 4), in Karczewiec, gr. 37 – pottery dated to the A2 phase (Dąbrowska 1973, 400, tab. VII: 7), in Kamieńczyk, gr. 119 – a type K fibula (Dąbrowska 1997, 33, tab. LXIV: 6), gr. 318 – type K fibula after Kostrzewski (1919) (Dąbrowska 1997, 64–65, tab. CXLIV: 5), gr. 356 – type D/E fibula after Kostrzewski (1919) (Dąbrowska 1997, 71, tab. CLXII: 2), gr. 367 – a type H fibula (Dąbrowska 1997, 73, tab. CLXXII: 2). Accordingly, the listed artefacts may be assigned to the A2 phase of the Early Pre-Roman Period. A slightly later date, to the A3 stage, should be given to pins from Oblin, gr. 12 – co-occurring with a type I knife, based on the classification used for Oblin grave field (Czarnecka 2007, 14, tab. XII: 2), gr. 56 – with a type M fibula (Czarnecka 2007, 24, tab. LXI: 6), gr. 93 – with a type M fibula after Kostrzewski (1919) (Czarnecka 2007, 32, tab. XCIX: 4). On the other hand, findings from the A2/A3 stage come from sites in: Kamieńczyk, gr. 89, which in the grave complex occurred with a Nauheim-type fibula after Kostrzewski (1919) (Dąbrowska 1997, 27, tab. XLVII: 3), and gr. 212 which was accompanied by an M-type fibula (Dąbrowska 1997, 50, tab. CXII: 6), as

Table 1. Type and sub-type hook pins 1.A.

Site	Grave number	Dating	Literature
1	2	3	4
Błonie, district Sandomierz	118	A2	Mycielska and Woźniak 1988, 71–72, tab. CIC: 2.
Błonie, district Sandomierz	189a	A2	Mycielska and Woźniak 1988, 95–96, tab. CLXVII: A-2.
Błonie, district Sandomierz	216	A2	Mycielska and Woźniak 1988, 103–104, tab. CLXXXIV: B-3.
Błonie, district Sandomierz	224	A2	Mycielska and Woźniak 1988, 105–106, tab. CLXXXVII: B-4.
Brzeźce 2, district Białobrzegi	9	B2	Balke 1976, 158–159, tab. IV: 4.
Ciebłowice Duże, district Tomaszów Mazowiecki	106	B2b–C1a	Dzięgielewska and Kulczyńska 2008, 33, tab. LXVIII: 6.
Ciebłowice Duże, district Tomaszów Mazowiecki	108	B2b–B2/C1	Dzięgielewska and Kulczyńska 2008, 34, tab. LXIX: 3.
Domaradzice, district Rawicz	22	B1–B2a	Kostrzewski 1953, 173, fig. 24: 3.
Drochlin, district Częstochowa	stray find	-	Kaczanowski 1987, 92–93, tab. XXVIII: 36.

1	2	3	4
Drochlin, district Częstochowa	stray find	-	Kaczanowski 1987, 92–93, tab. XXVIII: 37.
Gołębiewo, district Nidzica	4	B2	Maciałowicz 2010, 371–376, fig. 9: 4.
Kamieńczyk, district Wyszków	89	A2/A3	Dąbrowska 1997, 27, tab. XLVII: 3.
Kamieńczyk, district Wyszków	119	A2	Dąbrowska 1997, 33, tab. LXIV: 6.
Kamieńczyk, district Wyszków	212	A2/A3	Dąbrowska 1997, 50, tab. CXII: 6.
Kamieńczyk, district Wyszków	318	A2	Dąbrowska 1997, 64–65, tab. CXLIV: 5.
Kamieńczyk, district Wyszków	337	B1	Dąbrowska 1997, 68, tab. CLIV: 1.
Kamieńczyk, district Wyszków	356	A2	Dąbrowska 1997, 71, tab. CLXII: 2.
Kamieńczyk, district Wyszków	367	A2	Dąbrowska 1997, 73, tab. CLXXII: 2.
Karczewiec, district Węgrów	37	A2	Dąbrowska 1973, 400, tab. VII: 7.
Kokorzyn, district Kościan	4	B1–B2b	Kostrzewski 1956, 82–83, fig. 15: 5.
Łęgonice Małe, district Przysucha	17	B1	Liana 1976, 72–73, tab. V: 13.
Młodzikowo, district Środa Wielkopolska	52	B1–C2	Dymaczewski 1958, 221–223, fig. 92: 7.
Młodzikowo, district Środa Wielkopolska	253	B1–C2	Dymaczewski 1958, 387–389, fig. 447: 14.
Oblin, district Garwolin	12	A3	Czarnecka 2007, 14, tab. XIII: 2.
Oblin, district Garwolin	36	A2/A3	Czarnecka 2007, 19–20, tab. XXXVIII: 6.
Oblin, district Garwolin	56	A3	Czarnecka 2007, 24, tab. LXI: 6.
Oblin, district Garwolin	93	A3	Czarnecka 2007, 32, tab. XCIX: 4.
Oblin, district Garwolin	stray find	-	Czarnecka 2007, 72, tab. CCLXVI: 139.
Opatów, district Kłobuck	199	C1	Madyda-Legutko *et al.* 2011, 59, tab. LXVII: 3.
Opatów, district Kłobuck	317	C3–D1	Madyda-Legutko *et al.* 2011, 86, tab. CVIII: 5.
Opatów, district Kłobuck	677	C3–D1	Madyda-Legutko *et al.* 2011, 171, tab. LXXII: 37.
Opatów, district Kłobuck	stray find	-	Madyda-Legutko *et al.* 2011, 387–388, tab. CDXXX: 468.
Opatów, district Kłobuck	stray find	-	Madyda-Legutko *et al.* 2011, 387–388, tab. CDXXX: 469.
Pajewo-Szwelice, district Ciechanów	5/68	A3/B1	Dłubakowski 2005, 28–29, tab. XXIII: 5.
Wesółki, district Kalisz	28	B1	Kozłowska 1972, 372, fig. 21: d.
Wymysłowo, district Gostyń	97–98	A2–C3	Jasnosz 1952, 61–63, fig. 69: 11.
Wymysłowo, district Gostyń	146	A2–C3	Jasnosz 1952, 87–90, fig. 116: 18.
Wymysłowo, district Gostyń	233	A2–C3	Jasnosz 1952, 158–160, fig. 225: 22.
Wymysłowo, district Gostyń	338	B1–C1a	Jasnosz 1952, 224–225, fig. 349: 6.
Zadowice, district Gostyń	341	C1a	Kaszewska 1964, 118–119, tab. XIV: 11.

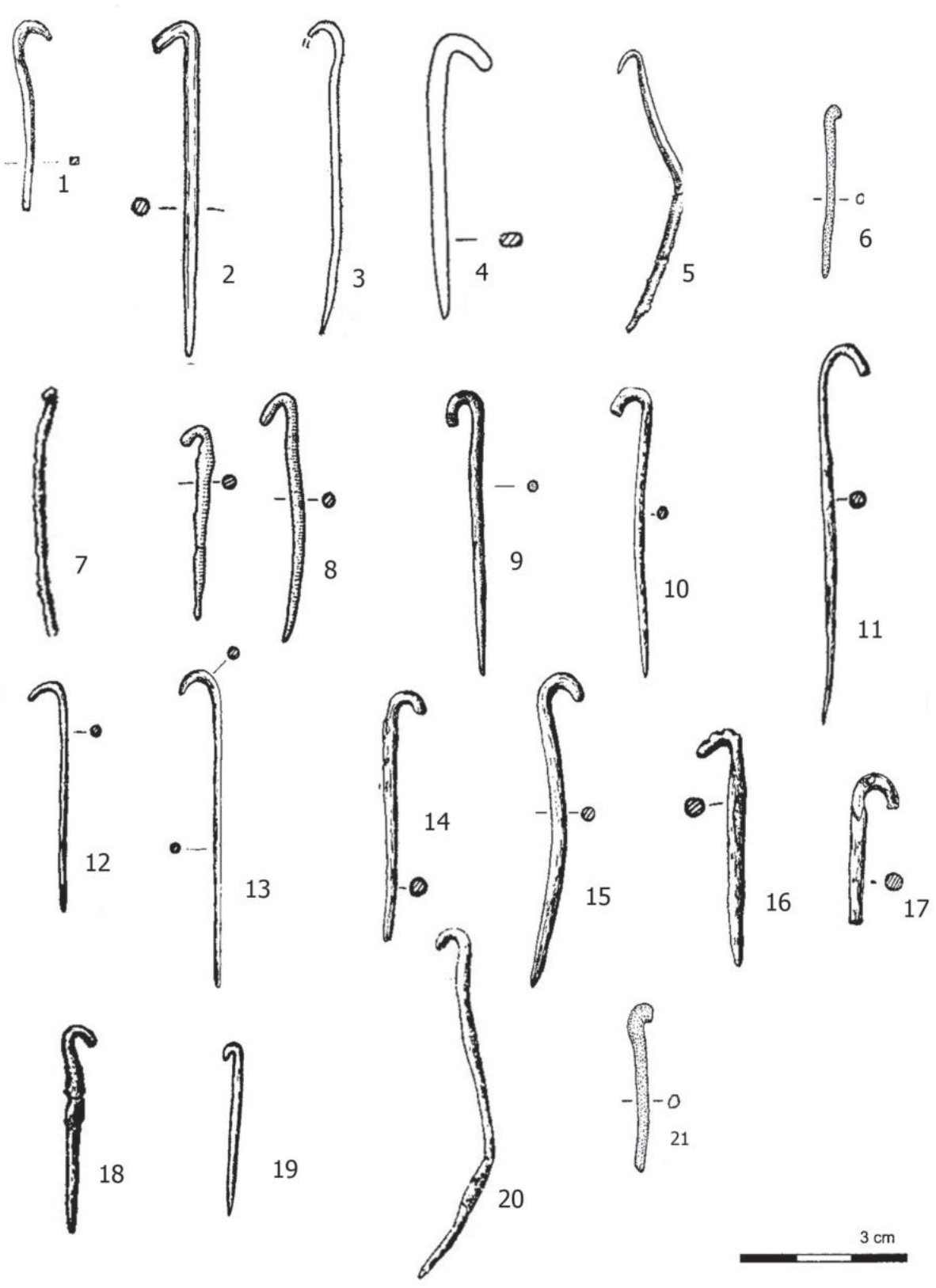

Fig. 4. Type 1.A hook pins from the Przeworsk culture.

1 – Błonie, gr. 118; 2 – Błonie, gr. 189a; 3 – Błonie, gr. 216; 4 – Błonie, gr. 224; 5 – Brzeźce, gr. 9; 6 – Ciebłowice Duże, gr. 106; 7 – Domaradzice, gr. 22; 8 – Drochlin, stray find; 9 – Gołębiewo, gr. 6; 10 – Kamieńczyk, gr. 89; 11 – Kamieńczyk, gr. 119; 12 – Kamieńczyk, gr. 212; 13 – Kamieńczyk, gr. 318; 14 – Kamieńczyk, gr. 337; 15 – Kamieńczyk, gr. 356; 16 – Kamieńczyk, gr. 367; 17 – Karczewiec, gr. 37; 18 – Kokorzyn, gr. 4; 19 – Łęgonice Małe, gr. 17; 20 – Młodzikowo, gr. 52; 21 – Ciebłowice Duże, gr. 108.

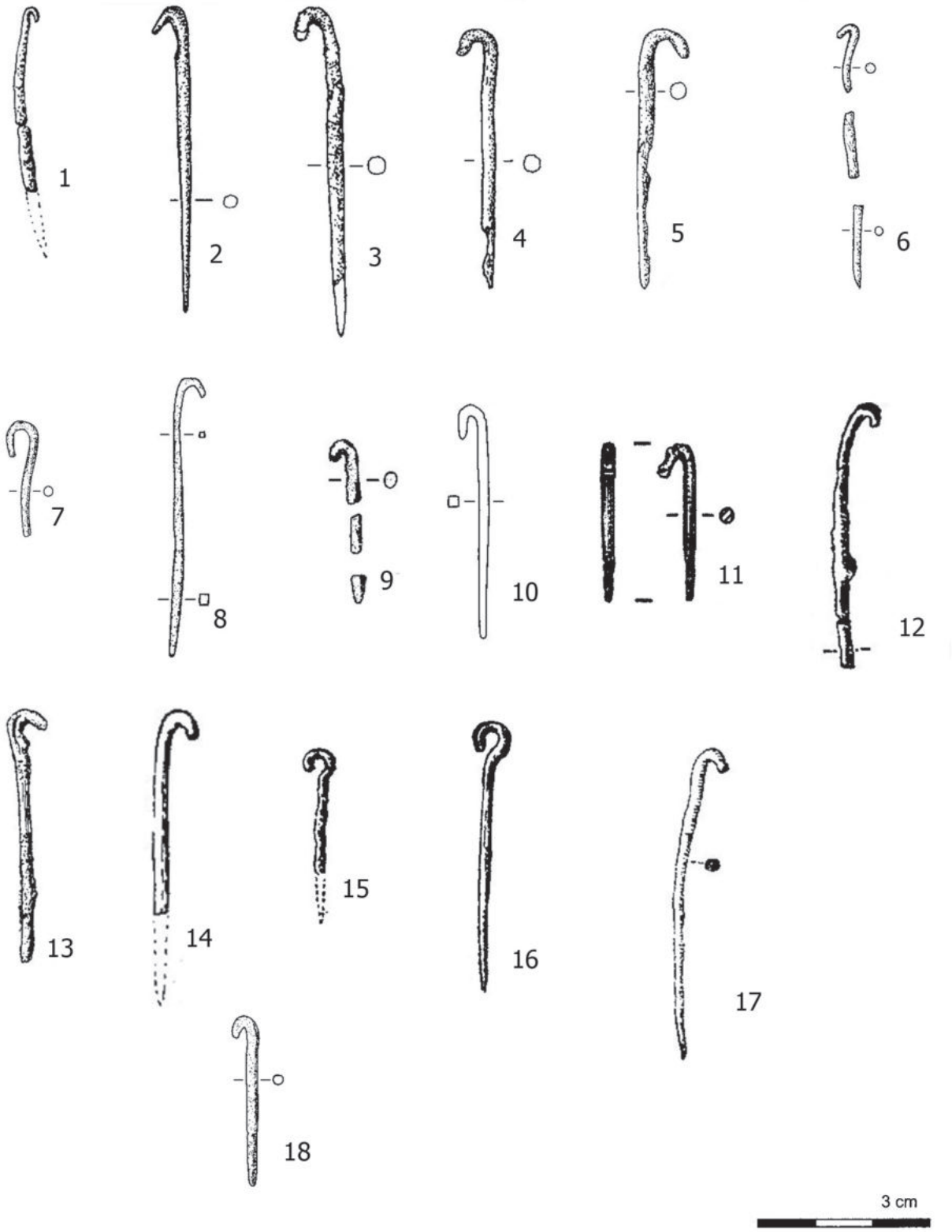

Fig. 5. Type 1.A hook pins from the Przeworsk culture.

1 – Młodzikowo, gr. 253; 2 – Oblin, gr. 12; 3 – Oblin, gr. 36; 4 – Oblin, gr. 56; 5 – Oblin, gr. 93; 6 – Oblin, stray find; 7 – Opatów, gr. 199; 8 – Opatów, gr. 317; 9 – Opatów, stray find; 10 – Opatów, stray find; 11 – Pajewo Szwelice, gr. 30; 12 – Wesółki – gr. 28; 13 – Wymysłowo, gr. 97–98; 14 – Wymysłowo, gr. 146; 15 – Wymysłowo, gr. 233; 16 – Wymysłowo, gr. 338; 17 – Zadowice, gr. 341; 18 – Opatów, gr. 677.

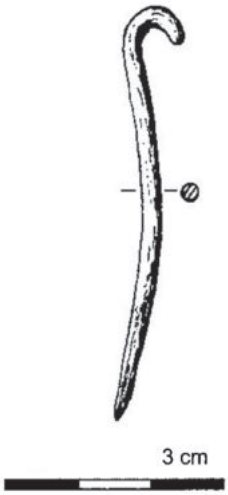

Fig. 6. Hook pin subtype 1.A (after Dąbrowska 1997, fig. CLXII: 2; modified by W. Stącel).

well as in Oblin, gr. 36 which in the grave complex co-occurred with a type M fibula (Czarnecka 2007, 19–20, tab. XXXVII: 6).

The hooked pins dated to phase B1 of the Early Roman Period, subtype 1.A, were accompanied in the grave complexes, among others: in Kamieńczyk, gr. 337 – a ceramic vessel of type A.3 after Almgren (1923) (Dąbrowska 1997, 68, tab. CLIV: 1), in Łęgonice Małe, gr. 17 – ceramic vessels dated to phase B1 (Liana 1976, 72–73, tab. V: 13), in Wesółki, gr. 28 – ceramic vessels type I, zw 1A, based on the classification used for Wesółki grave field (Kozłowska 1972, 372, fig. 21: d). On the other hand, the chronology of a pin from Gołębiewo, gr. 4, was established in the B2 phase, which was found in the complex with an inverted pear-shaped vessel of the A.1 type, based on the classification used for Gołębiewo grave field (Maciałowicz 2010, 371–376, tab. 9: 4). Pins from Ciebłowice Duże, where in gr. 106 they were placed together with a ceramic vessel, dated to the B1 phase (Dzięgielewska and Kulczyńska 2008, 33, tab. LXVIII: 6), and in gr. 108 they were accompanied by a fibula, dated to the B2/C1 phase (Dzięgielewska and Kulczyńska 2008, 34, tab. LXIX: 3), are dated to the younger Roman phase B2/C1.

The hooked pins of subtype 1.A were also used in the Late Roman Period. Some specimens from Opatów, gr. 199 (Madyda-Legutko *et al.* 2011, 59, tab. LXVII: 3), and from Zadowice, gr. 341 (Kaszewska 1964, 118–119, tab. XIV: 11) are dated to the C1 phase; in both cases the chronology of complexes was determined on the basis of the vessel ceramics. The chronology of the Opatów pin, gr. 317, which was associated with an iron key of type C13, based on the classification used for Opatów grave field (Madyda-Legutko *et al.* 2011, 86, tab. CVIII: 5), as well as gr. 677, which contained, among others, a fibula of type A.158 (Madyda-Legutko *et al.* 2011, 171, tab. CCXXXIII: 5).

The hooked pins of subtype 1.A have a wide distribution range (Fig. 5), as they were found in Masovia (16 examples), Greater Poland (8 examples), the Liswarta basin (7 examples), the Kamienna basin (4 examples), Central Poland (2 examples), Lower Silesia (2 examples), and Warmia and Masuria (1 example).

Subtype 1.B (Fig. 8, 9) includes hooked pins having a torsional shaft with a hooked head (Fig. 10). It is represented by 45 pieces, which correspond closest to group VI and form number 103 in the classification of B. Beckmann (1966, 33). The length of the shortest pin is 2.9 cm and the longest one measures 7.5 cm. Most probably, the torsion of the handles had a functional aspect – it facilitated the screwing of the pin into the body of the spindle and prevented it from slipping out (List of items, Tab. 2).

The chronology of examples from Karczewiec, gr. 116, which were found with a type K fibula (Dąbrowska 1973, 453–454, tab. XXIX: 10) and from Nadkole, gr. 23, which occurred in a complex with a ceramic vessel of type VB2, based on the classification used for Nadkole grave field (Andrzejowski 1998, 21, tab. XIX: 12), are dated to the A2 phase of the pre-Roman Period. On the other hand, a specimen from Karczewiec, gr. 60a, comes from the A3 phase and was

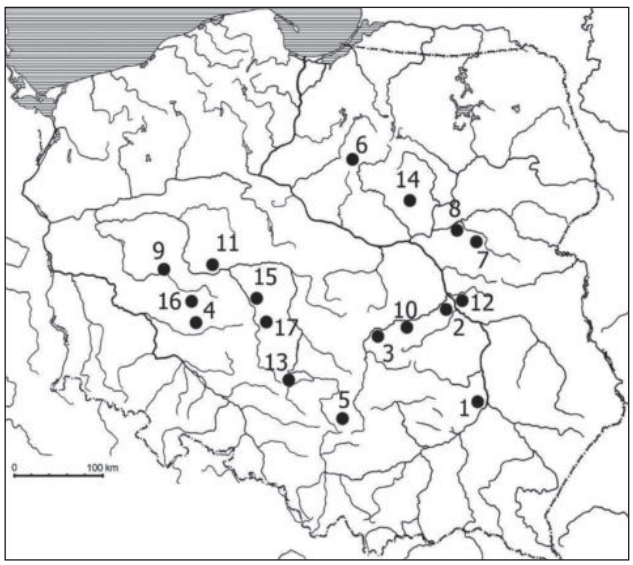

Fig. 7. The Przeworsk culture sites with hook pins of type 1.A.

1. Błonie; 2. Brzeźce 2; 3. Ciebłowice Duże; 4. Domaradzice; 5. Drochlin; 6. Gołębiewo; 7. Karczewiec; 8. Kamieńczyk; 9. Kokorzyn; 10. Łęgonice Małe; 11. Młodzikowo; 12. Oblin; 13. Opatów; 14. Pajewo-Szwelice; 15. Wesółki; 16. Wymysłowo; 17. Zadowice.

Table 2. Type and sub-type hook pins 1.B.

Site	Grave number	Dating	Literature
1	2	3	4
Brzeźce 1, district Białobrzegi	9	B2/C1	Balke 1976, 43– 44, fig. 16: C.
Brzeźce 2, district Białobrzegi	2	B2	Balke 1976, 158–159, tab. II: 6.
Brzeźce 2, district Białobrzegi	9	B2	Balke 1976, 163–168, tab. IV: 8.
Brzeźce 2, district Białobrzegi	20	B2	Balke 1976, 172–173, fig. 26: c.
Brzeźce 2, district Białobrzegi	30	B2	Balke 1976, 176, fig. 40: e.
Charłupia Mała, district Ostrowiec Świętokrzyski	5	B1c	Kurowicz and Olędzki 2002, 29–30, tab. XXVI: 5.
Chmielów Piaskowy, district Ostrowiec Świętokrzyski	2a	B2 (B2–C1a)	Godłowski and Wichman 1998, 15, tab. II: 3.
Chmielów Piaskowy, district Ostrowiec Świętokrzyski	34	B2 (B2/C1)	Godłowski and Wichman 1998, 32–33, tab. LI: 13.
Chmielów Piaskowy, district Ostrowiec Świętokrzyski	40	B2/C1	Godłowski and Wichman 1998, 37, tab. LXV: 11.
Chmielów Piaskowy, district Ostrowiec Świętokrzyski	52	C1	Godłowski and Wichman 1998, 39–40, tab. LXXII: 1.
Chmielów Piaskowy, district Ostrowiec Świętokrzyski	53b	B2b (B2b–C1a)	Godłowski and Wichman 1998, 40, tab. LXXIV: 7.
Chmielów Piaskowy, district Ostrowiec Świętokrzyski	58	B2	Godłowski and Wichman 1998, 41, tab. LXXVII: 7.
Chorula, district Krapkowice	37	B2–D1	Szydłowski 1964, 45–46, fig. 35: 3.
Ciebłowice Duże, district Tomaszów Mazowiecki	110	B2b	Dzięgielewska and Kulczyńska 2008, 34, tab. LXIX, LXX.
Ciebłowice Duże, district Tomaszów Mazowiecki	128	B2b–B2/C1	Dzięgielewska and Kulczyńska 2008, 38, tab. LXIX: 3.
Czarnocin, district Piotrków Trybunalski	stray find	-	Mączyńska and Jagusiak 2002, 358, tab. VII: 4.
Domaradzice, district Rawicz	144	B1–B2a	Kostrzewski 1953, 237–240, fig. 166: 13.
Domaradzyn, district Zgierz	7	B2–C1a	Piętka-Dąbrowska 1959–1960, 227, tab. LIV: 14.
Karczewiec, district Węgrów	60a	A3	Dąbrowska 1973, 417–418, tab. XIV: 5.
Karczewiec, district Węgrów	116	A2	Dąbrowska 1973, 453–454, tab. XXIX: 10.
Karczewiec, district Węgrów	stray find	-	Dąbrowska 1973, 499, tab. XLIX: 14.
Kołacz, district Mińsk Mazowiecki	9	B1	Dąbrowska 2002, 222–223, tab. IV: 9.
Konin, district Konin	106	B2–C3	Kostrzewski 1947, 244, fig. 86: 4.
Krupice, district Siemiatycze	207	B2/C1	Jaskanis 2005, 53, tab. LIX: 2.
Kuców, district Bełchatów	47	B2/C1–C1b	Olędzki 1985, 72, tab. XVIII: 7.
Łętowice, district Tarnów	7	A3–B2	Szpunar 1987, 185, fig. 6: d.

1	2	3	4
Młodzikowo, district Środa Wielkopolska	70	B1–C2	Dymaczewski 1958, 239, fig. 122: 22.
Nadkole, district Węgrów	6	B2	Andrzejowski 1998, 17, tab. VI: 9.
Nadkole, district Węgrów	23	A2	Andrzejowski 1998, 21, tab. XIX: 12.
Nadkole, district Węgrów	97	B2	Andrzejowski 1998, 39, tab. LXII: 14.
Nadkole, district Węgrów	stray find	-	Andrzejowski 1998, 51, tab. LXXXIX: 38.
Niedanowo, district Nidzica	505	B2	Ziemlińska-Odojowa 1999, 89, tab. CLXXXIII: 8.
Oblin, district Garwolin	182	A2–B2	Czarnecka 2007, 49, CLXXII: 1.
Oblin, district Garwolin	186	B2	Czarnecka 2007, 49, tab. CLXXIV: 4.
Oblin, district Garwolin	204	A2–B2	Czarnecka 2007, 52, tab. CLXXXIII: 1.
Opatów, district Kłobuck	19	B2/C1	Madyda-Legutko *et al*. 2011, 33, tab. VII: 15.
Opatów, district Kłobuck	545	C3-D1	Madyda-Legutko *et al*. 2011, 135–136, tab. CLXXXV: 4.
Opatów, district Kłobuck	1216	C1	Madyda-Legutko *et al*. 2011, 246–247, tab. CCCLXXX: 4.
Opatów, district Kłobuck	ZG83	B2/C1	Madyda-Legutko *et al*. 2011, 268, tab. CCCXCIX: 2.
Opatów, district Kłobuck	stray find	-	Madyda-Legutko *et al*. 2011, 387–388, tab. CDXXX: 473.
Starachowice, district Starachowice	1	C1b	Jamka 1957/1958, 32–35, fig. 4: f.
Starachowice, district Starachowice	6	B2a/B2b	Jamka 1957/1958, 41, fig. 16: g.
Tarnów, district Nysa	116	B2	Godłowski and Szadkowska 1975, 69, tab. XLIII: 2.
Wymysłowo, district Gostyń	262	A2–C3	Jasnosz 1952, 175–176, fig. 258: 12.
Żdżarów, district Sochaczew	138	B2b–D	Nowakowski and Tyszler 1998, 106–107, tab. VI: 2.

found in a site with ceramic pottery dating to the A3 phase (Dąbrowska 1973, 417–418, tab. XIV: 5).

The hooked pins dated to the B1 phase of the Early Roman Period, subtype 1.B were accompanied in the grave complexes of, among others: Charłupia Mała, gr. 5 – a type A.68 fibula after Almgren (1923) (Kurowicz and Olędzki 2002, 29–30, tab. XXVI: 5), Kołacz, gr. 9 – a type A.68 fibula (Dąbrowska 2002, 222–223, tab. IV: 9). On the other hand, from the B2 phase come hooked pins, which were accompanied in the sites, among others: in Brzeźec, site 2, gr. 2, – pottery dated to the B2 phase (Balke 1976, 158–159, tab. II: 6), gr. 9 – a type A.37 fibula after Almgren (1923) (Balke 1976, 163–168, tab. IV: 4), gr. 20 – pottery dated to the B2 phase (Balke 1976, 172–173, fig. 26: c), gr. 30 – a type A.38 fibula after Almgren (1923) (Balke 1976, 176, fig. 40: e), in Chmielów Piaskowy, gr. 58 – a type A.123 fibula after Almgren (1923) (Godłowski and Wichman 1998, 41, tab. LXXVII: 7), in Ciebłowice Duże, gr. 110 – a key dated to phase B2, based on the classification used for Ciebłowice Duże grave field (Dzięgielewska and Kulczyńska 2008, 34, tab. LXIX: 3), in Nadkole, gr. 6 – two fibulae, type A.38 and A.39 after Almgren (1923) (Andrzejowski 1998, 17, tab. VI: 9) gr. 97 – a type A.77/79 fibula after Almgren (1923) (Andrzejowski 1998, 39, tabl. LXI–LXII: 14, 15), from Niedanowo, gr. 505 – a ceramic vessel, type A.2, based on the classification used for Niedanowo grave field (Ziemlińska-Odojowa 1999, 89, tab. CLXXXIII: 2), from Oblin, gr. 186 – a type A.61 fibula after Almgren

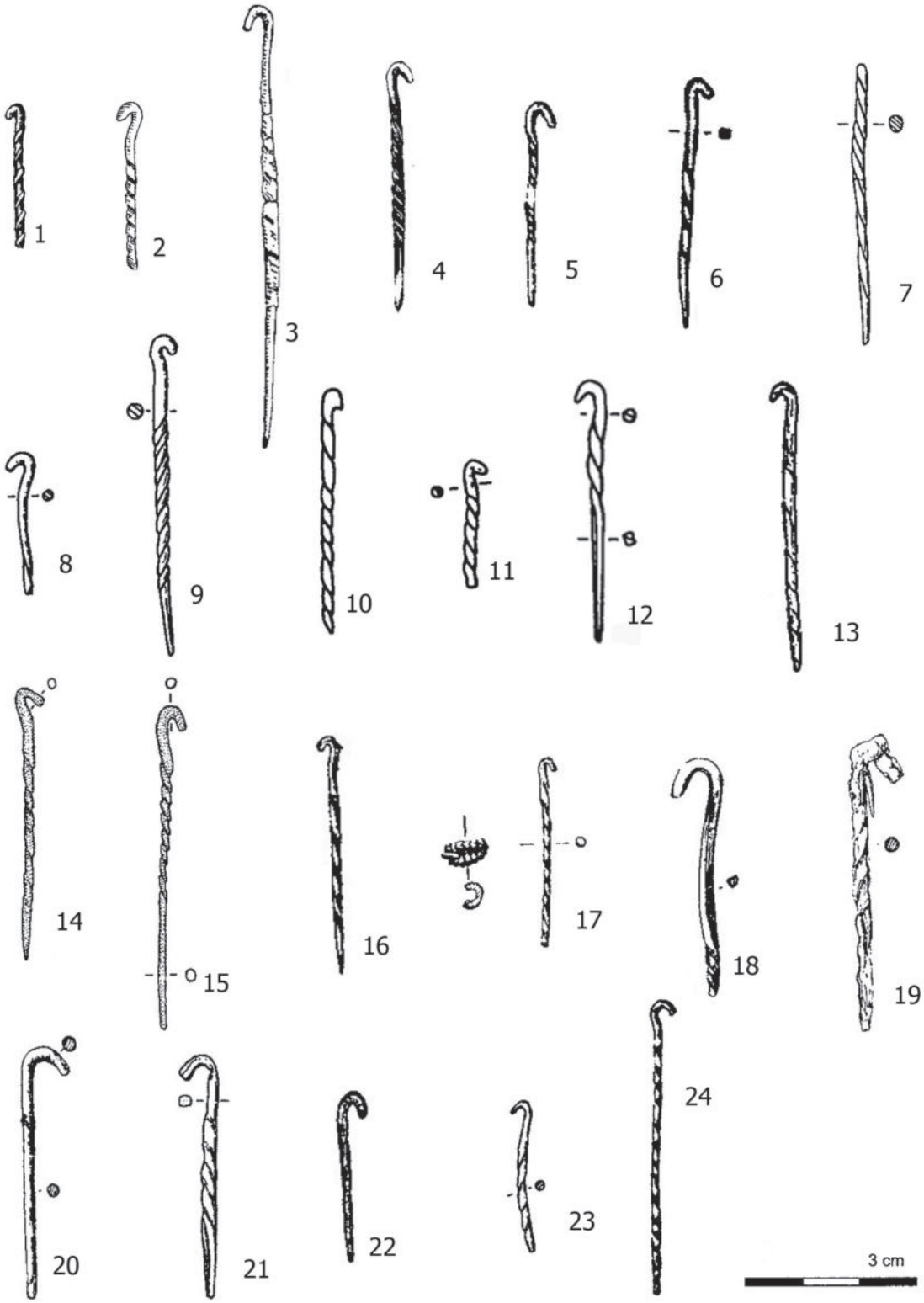

Fig. 8. Type 1.B hook pins from the Przeworsk culture.

1 – Brzeźce 1, gr. 9; 2 – Brzeźce 2, gr. 2; 3 – Brzeźce 2, gr. 9; 4 – Brzeźce 2, gr. 20; 5 – Brzeźce 2, gr. 30; 6 – Charłupia Mała, gr. 5; 7 – Chmielów Piaskowy, gr. 2a; 8 – Chmielów Piaskowy, gr. 34; 9 – Chmielów Piaskowy, gr. 40; 10 – Chmielów Piaskowy, gr. 52; 11 – Chmielów Piaskowy, gr. 53b; 12 – Chmielów Piaskowy, gr. 58; 13 – Chorula, gr. 37; 14 – Ciebłowice Duże, gr. 110; 15 – Ciebłowice Duże, gr. 128; 16 – Domaradzice, gr. 144; 17 – Domaradzyn, gr. 7; 18 – Karczewiec 60a; 19 – Karczewiec, gr. 116; 20 – Karczewiec, stray find; 21 – Kołacz, gr. 9; 22 – Konin, gr. 106; 23 – Krupice, gr. 207; 24 – Czarnocin, stray find.

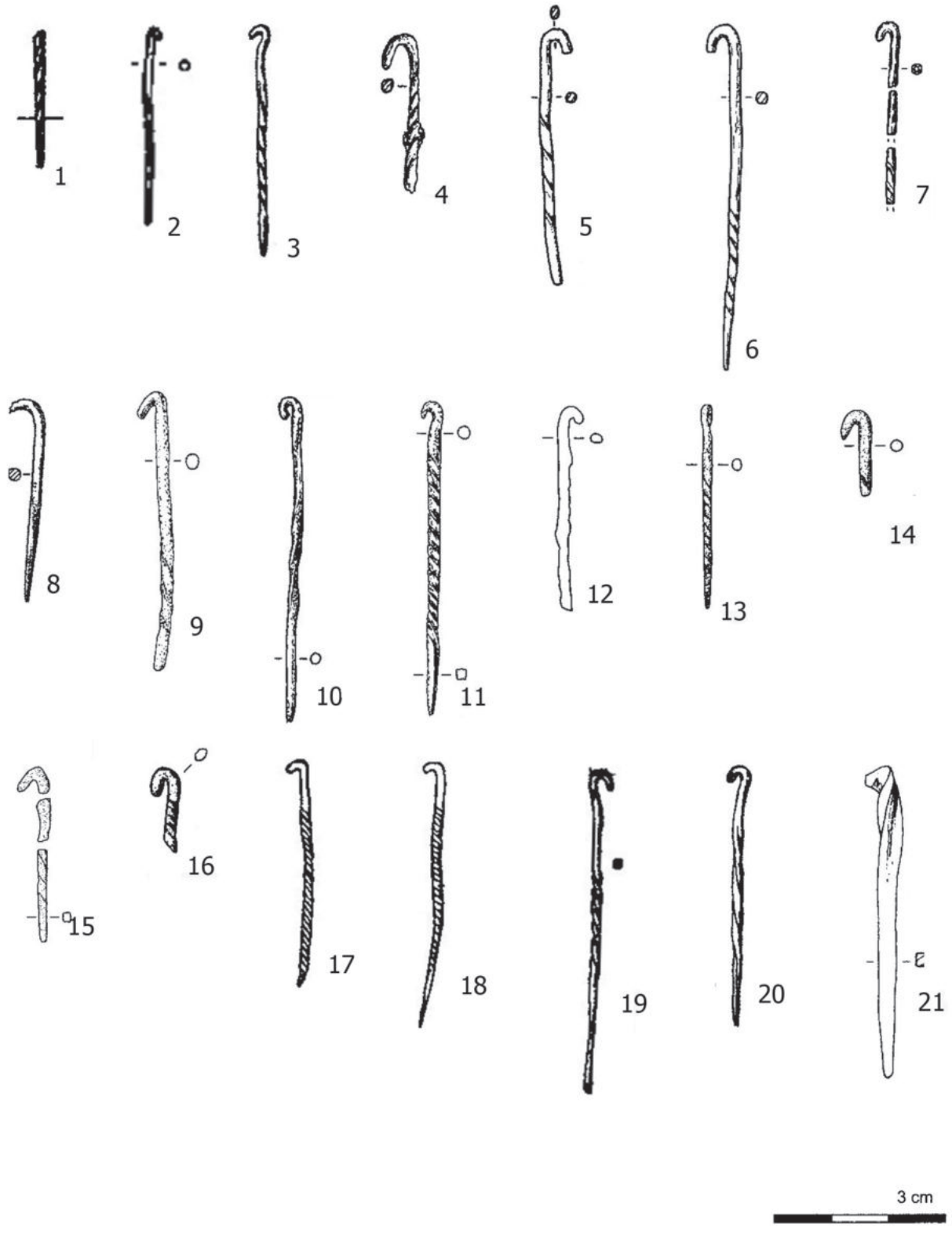

Fig. 9. Type 1.B hook pins of the Przeworsk culture.

1 – Kuców, gr. 47; 2 – Łętowice, gr. 7; 3 – Młodzikowo, gr. 70; 4 – Nadkole, gr. 6; 5 – Nadkole, gr. 23; 6 – Nadkole, gr. 97; 7 – Nadkole stray find; 8 – Niedanowo, gr. 505; 9 – Oblin, gr. 182; 10 – Oblin, gr. 186; 11 – Oblin, gr. 204; 12 – Opatów, gr. 19; 13 – Opatów, gr. 545; 14 – Opatów, gr. 1216; 15 – Opatów, a stray find; 16 – Opatów, gr. Zg83; 17 – Starachowice, gr. 1; 18 – Starachowice, gr. 6; 19 – Tarnów, gr. 116; 20 – Wymysłów, gr. 262; 21 – Żdżarów, gr. 138.

Fig. 10. Hook pin subtype 1.B (after Godłowski and Wichman 1998, 158, fig. LXV; modified by W. Stącel).

(1923) (Czarnecka 2007, 49, tab. CLXXIV: 4), from Starachowice, gr. 6 – pottery dated to phase B2 (Jamka 1957/1958, 41, fig. 16: g), from Tarnów, gr. 116 – a type A.40 fibula after Almgren (1923) (Godłowski and Szadkowska 1972, 69, tab. XLIII: 2). Subsequently, the hooked pins dated to the B2/C1 phase were accompanied, among others, in Brzeźce, site 1, gr. 9 – a bone comb after Chmielowska (1971) (Balke 1976, 43–44, fig. 16: c), in Chmielów Piaskowy, gr. 2a – a belt buckle type M-L.D1, based on the classification used for Chmielów Piaskowy grave field (Godłowski and Wichman 1998, 15, tabl. II: 3), gr. 34 – a type fibul A.V series 8 after Almgren (1923) (Godłowski and Wichman 1998, 32–33, tabl. LI: 13), gr. 40 – a fibula type A.43 after Almgren (1923) (Godłowski and Wichman 1998, 37, tab. LXV: 11), gr. 53b – a fibula type A.V series 8 after Almgren (1923) (Godłowski and Wichman 1998, 40, tab. LXXIV: 7), in Ciebłowice Duże, gr. 128 – a key dated to phase B1, based on the classification used for Ciebłowice Duże grave field (Dzięgielewska and Kulczyńska 2008, 38, tab. LXXX: 4), in Krupice, gr. 207 – a type A.V ser. 8 fibula (Jaskanis 2005, 53, tab. LIX, LX: 2), in Opatów, gr. 19 – a type XIX spearhead, based on the classification used for Opatów grave field (Madyda-Legutko *et al.* 2011, 33, tab. VII; VIII: 15), gr. ZG83 – a type A.40 fibula (Madyda-Legutko *et al.* 2011, 268, tab. CCCXCIX: 2).

The chronology of hooked pins from Chmielów Piaskowy, gr. 52, which co-occurred with a bucket pendant of the Ka. II type, based on the classification used for Chmielów Piaskowy grave field (Godłowski and Wichman 1998, 39–40, tab. LXXII: 1) and from Opatów, gr. 1216, which in group was accompanied by a fibula of the A.158 type (Madyda-Legutko *et al.* 2011, 246–247, tab. CCCLXXX: 4). A hooked pin from Opatów, gr. 545, is dated to the turn of phases C3/D1, i.e. to the Late Roman Period and the beginning of the Migration Period. It occurred in the complex with the typical for this chronological section vessel ceramics (Madyda-Legutko *et al.* 2011, 135–136, tab. CLXXXV: 4).

As well as the pins of subtype 1.A discussed above, specimens of subtype 1.B are found all over the area of the Przeworsk culture (Fig. 11), as they were discovered in Masovia (17 examples), Świętokrzyskie (9 examples), Central Poland (5 examples), Silesia (5 examples), Greater Poland (4 examples), Opole region (2 examples), Lesser Poland (1 examples), Podlasie (1 examples) and Warmia and Masuria (1 examples).

Type 2 comprises hooked pins made of copper alloys (Tab. 5). The length of the preserved type 2 hooked pins varies from 2.5 cm to 7.5 cm. This type is represented by 12 pieces. Due to the shape of the handle, two subtypes (2.A and 2.B) were identified among the 12 hooked pins.

Subtype 2.A (Fig. 12) consists of hooked pins with a straight, i.e. not torsional handle (Fig. 13). This subtype includes 5 pieces, which correspond to monuments classified in group VI, number 104 in B. Beckmann's classification (1966, 33). The shortest pin is 4.6 cm long and the longest 5.5 cm. In terms of form,

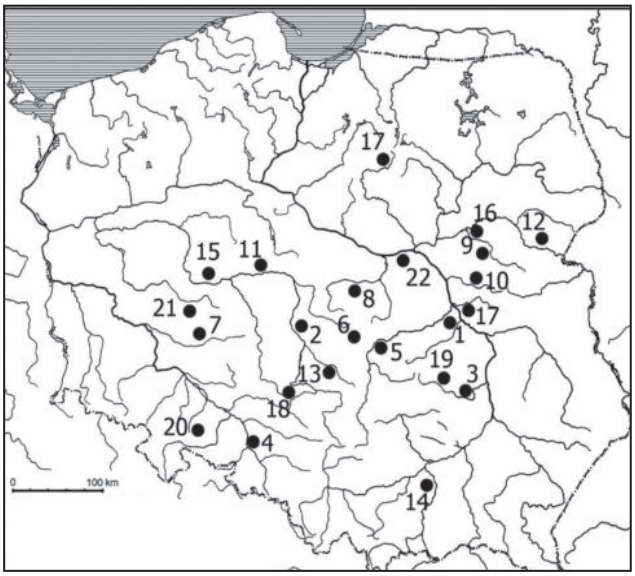

Fig. 11. The Przeworsk culture sites with hook pins of type 1.B.

1. Brzeźce 1, 2; 2. Charłupia Mała; 3. Chmielów Piaskowy; 4. Chorula; 5. Ciebłowice Duże; 6. Czarnocin; 7. Domaradzice; 8. Domaradzyn; 9. Karczewiec; 10. Kołacz; 11. Konin; 12. Krupice; 13. Kuców; 14. Łętowice; 15. Młodzikowo; 16. Nadkole; 17. Niedanowo; 18. Opatów; 19. Starachowice; 20. Tarnów; 21. Wymysłowo; 22. Żdżarów.

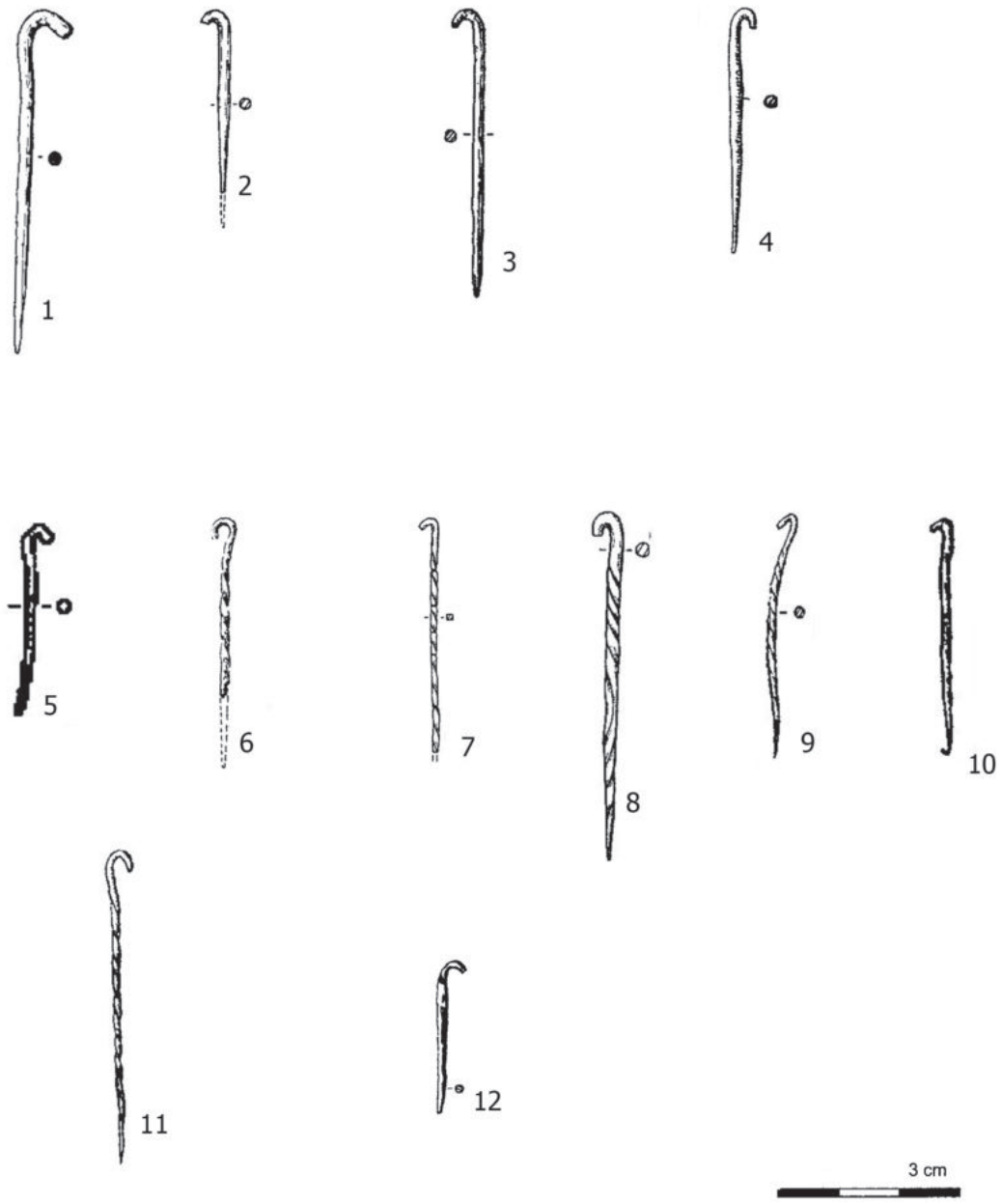

Fig. 12. Types 2.A and 2.B hook pins from the Przeworsk culture.

1 – Karczewiec, gr. 75a; 2 – Nadkole, gr. 63; 3 – Nadkole, gr. 142; 4 – Warszawa-Kawęczyn, stray find; 5 – Mierzyn-Grobla, gr. 80; 6 – Młodzikowo, gr. 5; 7 – Nadkole, gr. 80c; 8 – Nadkole, gr. 97; 9 – Niecieplin, gr. 15; 10 – Słopanowo, gr. 19; 11 – Słopanowo, gr. 43; 12 – Czarnocin, stray find.

these pieces like the previous ones, constitute a very homogeneous group (List of items, Tab. 3).

The chronology of the hooked pin from Karczewiec, gr. 75a, which in the archaeological group co-occurred with a Nauheim type fibula, was established in the A2 phase of the Pre-Roman Period (Dąbrowska 1973, 422–427, tab. XVI: 13). At the B2 stage of the Roman Period are dated monuments from Nadkole, gr. 63, where the hooked pin co-occurred with a fibula of the A.38–39 type (Andrzejowski 1998, 32, tab. XLV: 9), and gr. 142, where the hooked pin was accompanied by a fibula of the A.77 type (Andrzejowski 1998, 50, tab. LXXXVI: 7). The lack of dating artefacts in the grave complexes does not allow to determine the exact chronology of the remaining pieces. Hooked pins of subtype 2.A have a small distribution range (Fig. 14), as they have only been discovered in Masovia (4 examples) and Central Poland (1 example).

Subtype 2.B (Fig. 15) consists of hooked pins made of copper alloy, with a torsional shaft (Fig. 16).

Table 3. Type and sub-type hook pins 2.A.

Site	Grave number	dating	Literature
Czarnocin, district Piotrków Trybunalski	stray find	-	Mączyńska and Jagusiak 2002, 358, tab. VII: 5.
Karczewiec, district Węgrów	75a	A2	Dąbrowska 1973, 422–427, tab. XVI: 13.
Nadkole, district Węgrów	63	B2	Andrzejowski 1998, 32, tab. XLV: 9.
Nadkole, district Węgrów	142	B2	Andrzejowski 1998, 50, tab. LXXXVI: 7.
Warszawa-Kawęczyn, district Warszawa	1	B2/C1–C3/D	Jankowska 1962, 331, tab. LXXI: 12.

Fig. 13. Hook pin subtype 2.A (after Dąbrowska 1997, 237, fig. LXXXVI: 7; modified by W. Stącel).

This type of hooked pins is represented by 7 examples, which correspond closest to group VI and form number 103 in the classification of B. Beckmann (1966, 33). The length of the shortest is 3.1 cm and the longest is 5.6 cm. Similar to the subtypes discussed above, the subtype 2.B examples represent a very homogeneous collection (List of items, Tab. 4).

The oldest hooked pins of this type found in the Przeworsk culture are documented as late as phase B2 of the Roman Period. The artefacts come from the site: Nadkole, from gr. 80c and 97, where in gr. 80c the hooked pin occurred with a belt buckle type AD1, based on the classification used for Nadkole grave field (Andrzejowski 1998, 35, tab. LII: 6), and in gr. 97 – with a fibula type A.77/79 (Andrzejowski 1998, 39, tab. LXI, LXII: 14, 15). The chronology of a hooked pin from Słopanów, gr. 19, which co-occurred in the grave with a fibula type A.40, was established at the B2/C1 stage of the Roman Period (Przewoźna 1954, 104–105, fig. 54: 4). The lack of dating artefacts in the grave complexes does not allow the determination of the exact chronology of the remaining pieces.

Fig. 14. The Przeworsk culture sites with hook pins of type 2.A.

1. Czarnocin; 2. Nadkole; 3. Warszawa-Kawęczyn; 4. Karczewiec.

The hooked pins of subtype 2.B also have a small distribution range (Fig. 17), as they were discovered in Masovia (4 examples) and Greater Poland (3 examples).

The shaft type could not be determined in all cases (Fig 18). This remark applies to pieces from the sites: Brzeźce 2, gr. 22 (Balke 1976, 173–174, tab. VI: 4), Charłupia Mała, gr. 19 (Kurowicz and Olędzki 2002, 19–20, tab. XII, XIII/19: 10), Domaradzice, gr. 126 (Kostrzewski 1953, 227–228, fig. 142: 13), Nadkole, gr. 56 (Andrzejowski 1998, 30, tab. XLI: 13), Niedanowo, gr. 478 (Ziemlińska-Odojowa 1999, 85, tab. CLXXIV: 8), Opatów – 2 examples discovered separately (Madyda-Legutko *et al.* 2011, 387–388, tab. CDXXX: 473), Słopanowo, gr. 27 (Przewoźna 1954, 107–108, fig. 58: 7), Osieck – 2 copies from one grave, no. 36 (Dąbrowska 1958, 274, tab. XCII: 2) (List of items, Tab. 5).

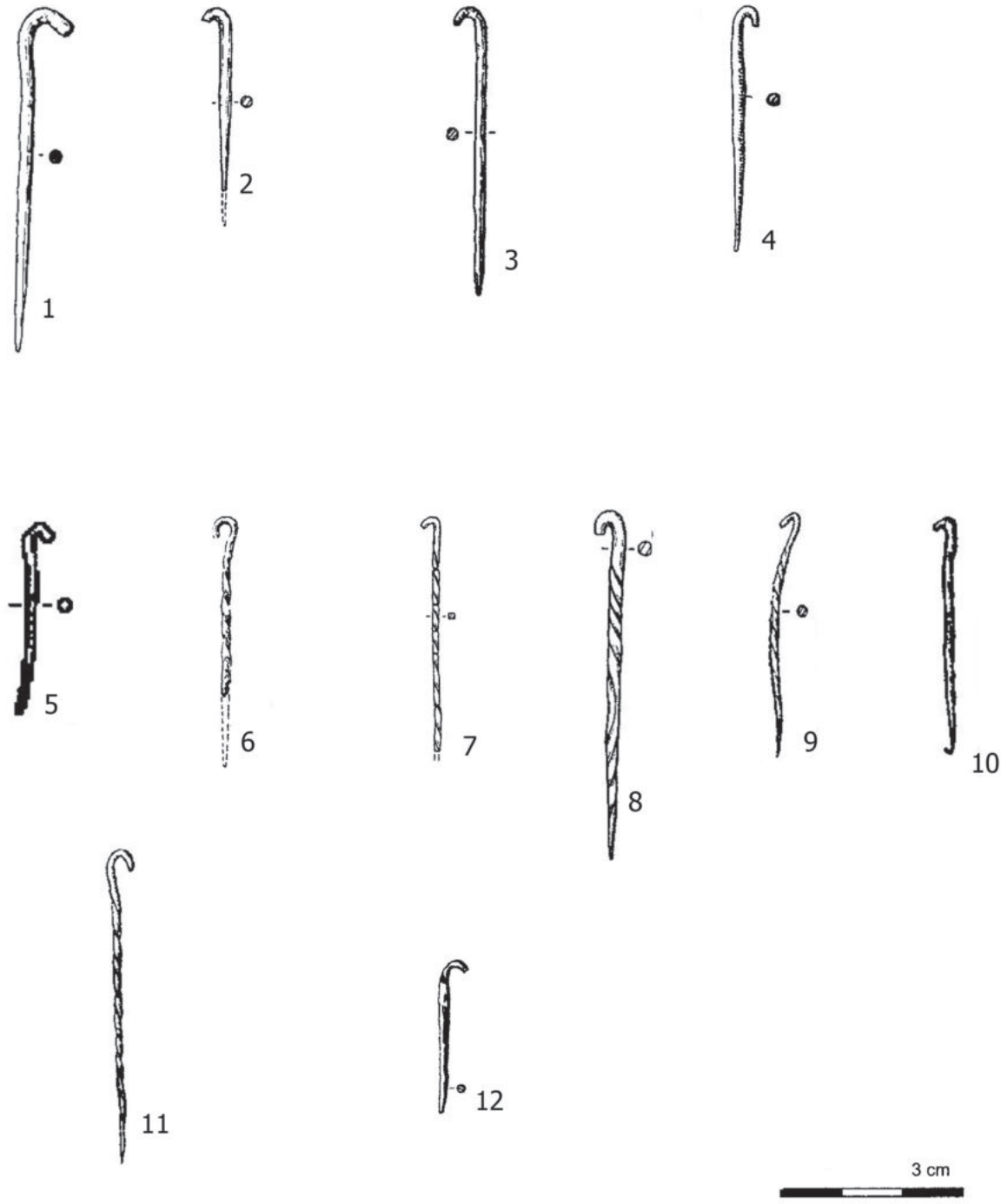

Fig. 15. Types 2.A and 2.B hook pins from the Przeworsk culture.

1 – Karczewiec, gr. 75a; 2 – Nadkole, gr. 63; 3 – Nadkole, gr. 142; 4 – Warszawa-Kawęczyn, stray find; 5 – Mierzyn-Grobla, gr. 80; 6 – Młodzikowo, gr. 5; 7 – Nadkole, gr. 80c; 8 – Nadkole, gr. 97; 9 – Niecieplin, gr. 15; 10 – Słopanowo, gr. 19; 11 – Słopanowo, gr. 43; 12 – Czarnocin, stray find.

Fig. 16. Hook pin subtype 2.B (after Dąbrowska 1997, 213, fig. LXII: 14; modified by W. Stącel).

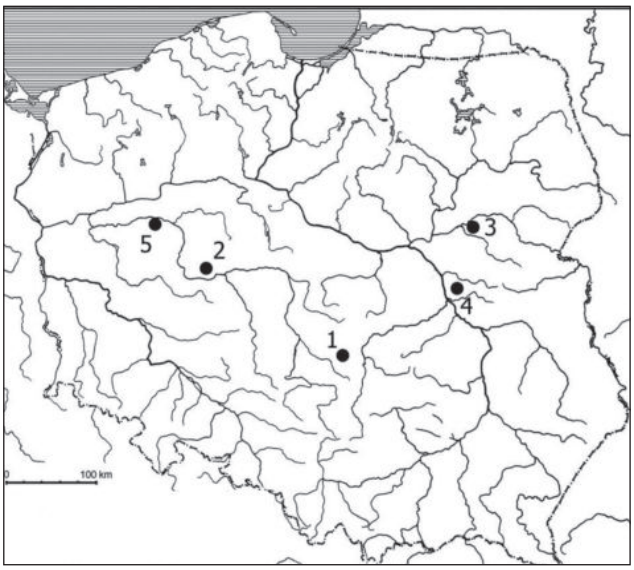

Fig. 17. The Przeworsk culture sites with hook pins of type 2.B.

1. Mierzyn-Groble; 2. Młodzikowo; 3. Nadkole; 4. Niecieplin; 5. Słopanowo.

Table 4. Type and sub-type hook pins 2.B.

Site	Grave number	Dating	Literature
Mierzyn Groble, district Piotrków Trybunalski	80	C2/D1	Ziętek 2004, 38, tab. XXI: 7.
Młodzikowo, district Środa Wielkopolska	5	B1–C2	Dymaczewski 1958, 183–184, fig. 10: 5.
Nadkole, district Węgrów	80c	B2	Andrzejowski 1998, 35, tab. LII: 6.
Nadkole, district Węgrów	97	B2	Andrzejowski 1998, 39, tab. LXII: 15.
Niecieplin, district Węgrów	XV	B1–C1a	Kozłowska 1958, 346, tab. CX: 21.
Słopanowo, district Szamotuły	19	C1a/C1b	Przewoźna 1954, 104–105, fig. 54: 4.
Słopanowo, district Szamotuły	43	B2a–B2b	Przewoźna 1954, 115–116, fig. 70: 3.

Table 5. No information on type and subtype of hook pins.

Site	Grave number	Dating	Literature
Brzeźce 2, district Białobrzegi	22	B2/C1	Balke 1976, 173–174, tab. IV: 4.
Charłupia Mała, district Środa Wielkopolska	19	B1	Kurowicz and Olędzki 2002, 19–20, tab. XIII: 10.
Domaradzice, district Rawicz	126	B1–B2a	Kostrzewski 1953, 227–228, fig. 142: 9.
Nadkole, district Węgrów	56	B1	Andrzejowski 1998, 30, tab. XLI: 13.
Niedanowo, district Nidzica	478	B1b	Ziemlińska-Odojowa 1999, 85, tab. CLXXIV: 8.
Opatów, district Kłobuck	stray find	-	Madyda-Legutko *et al.* 2011, 387–388, tab. CDXXX: 469.
Opatów, district Kłobuck	stray find	-	Madyda-Legutko *et al.* 2011, 387–388, tab. CDXXX: 470.
Osieck, district Otwock	36	B2b–C1	Dąbrowska 1958, 274, tab. XCII: 2.
Osieck, district Otwock	36	B2b–C1	Dąbrowska 1958, 274, tab. XCII: 2.
Słopanowo, district Szamotuły	27	C1b–C2	Przewoźna 1954, 107–108, fig. 58: 7.

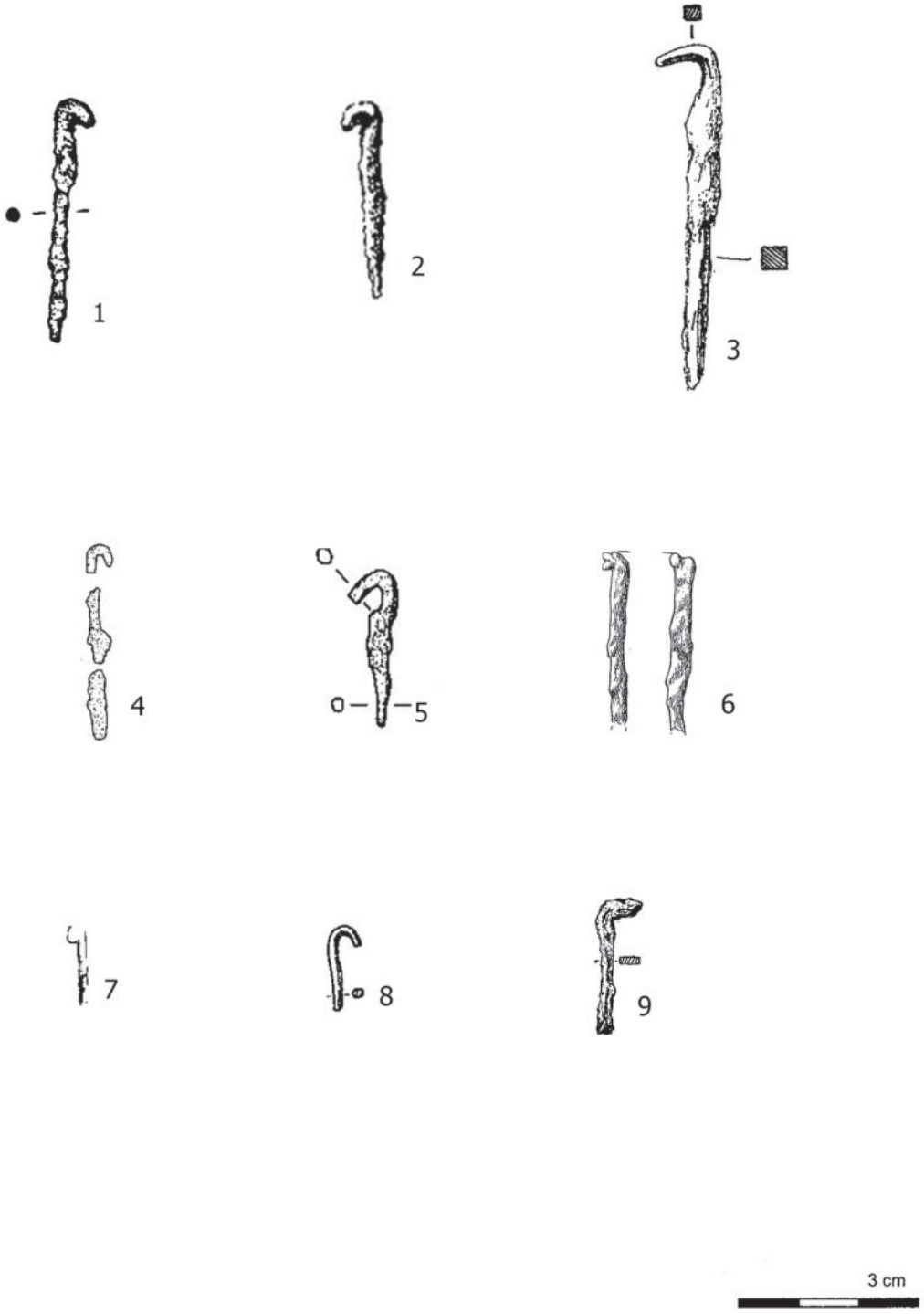

Fig. 18. Hook pins typologically unidentified from the Przeworsk culture.

1 – Charłupia Mała, gr. 19; 2 – Domaradzice, gr. 126; 3 – Niedanowo, gr. 478; 4 – Opatów, stray find; 5 – Opatów, stray find; 6 – Osieck, gr. 26; 7 – Brzeźce 2, 22; 8 – Nadkole, gr. 56; 9 – Słopanowo, gr. 27.

Function – the presence of hook pins in grave complexes

As mentioned, hooked pins are now generally considered to be a part of spindles, tools associated with textile manufacturing. It is assumed that spinning was generally the domain of women in Central European *Barbaricum*, and that they undertook this activity as part of their domestic work. This assumption should, however, be verified by an analysis of the occurrence of hooked pins in grave sites. The Przeworsk culture was dominated by the cremation ritual (Czarnecka 1990, 89), therefore the study of the remains is difficult. Despite these problems, an analysis was carried out to show the connection (or lack of connection) between the sex of the deceased and the presence of the hooked pins in the grave inventory (Fig. 19). The analysis was based on 56 complexes in relation to which we have the results of anthropological studies, but also those in which archaeological gender markers were present. This group represents 59% of all the graves included in this study.

The largest proportion of identified graves are female burials, accounting for 18% of graves. These include the following burials: Brzeźce 2, from graves numbered: 2, 20, 30, 32 (Balke 1976, 158–180), Nadkole, from graves numbered: 6, 23, 63, 97, 142 (Andrzejowski 1998, 17–50), Kamieńczyk, from graves numbered: 119 and 212 (Dąbrowska 1997, 33–50), Chmielów Piaskowy, from graves numbered: 2a and 34 (Godłowski and Wichman 1998, 15–33), Kołacz, from grave number 9 (Dąbrowska 2002, 222–223), Krupice, from grave number 207 (Jaskanis 2005, 53), Opatów, from grave number 677 (Madyda-Legutko *et al.* 2011, 171), Wymysłowo, from grave numbers 97 and 98 (Jasnosz 1952, 61–63), Słopanowo, from grave numbers 27, 43 (Przewoźna 1954, 107–116), Wólka Domaniowska, from grave number 25 (Olędzki 2000, 13). There are 11% of mass graves. These are burials of women with children (four such graves), one burial of a man with a child and collective burials of children only (two or even four children in one grave). The lowest number of graves are those of men and children – 6% each. In 17% of the graves, it was impossible to determine the sex of the deceased. In conclusion, the anthropological analysis of the Przeworsk culture burials, in which hooked pins were found, shows that this category of artefacts was most often found in the graves of women. It should be added here that hooked pins are very often found in graves with spindle whorls – 58 out of 95 graves with hooked pins contained spindle whorls. They also often occur together with needles.

Summary

As a result of the analyses, types and subtypes of hooked pins were identified. The criterion for their distinction was the metal material from which the objects were made (1 – iron, 2 – copper alloys).

Iron pins predominate in the complexes of the Przeworsk culture, with a slight predominance of examples with a torsional shaft. Copper alloy pins are much less numerous. Most of them occur in the vicinity of the zone occupied by the settlement of the Wielbark culture, e.g. specimens from Masovia and northern Greater Poland. The presence of hooked pins made of the copper alloy in the graves of the Przeworsk culture in the mentioned areas may be related to the neighbouring with this specific cultural

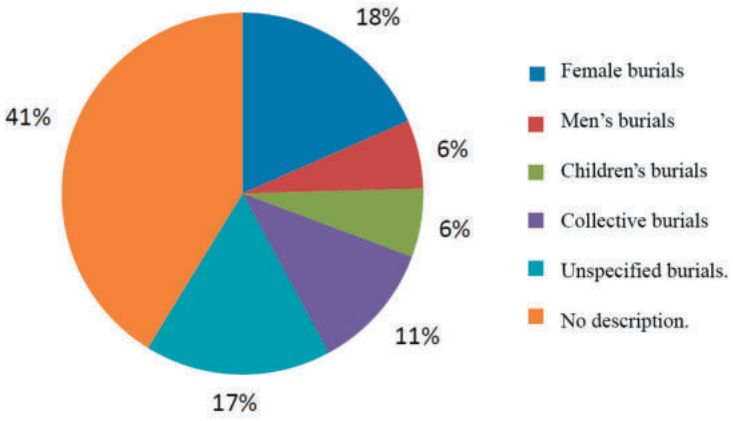

Fig. 19. Percentage of burials in the presented graves.

entity. The clear disproportion of pins results from the well-known reluctance of the people from the Wielbark culture to equip the deceased with iron relics as opposed to the people from the Przeworsk culture. Right now, there is a lack of the comparison of hooked pins from the Wielbark culture so it seems legitimate to create a comparison of this category in the future. The hooked pins are found in complexes of the Przeworsk culture dated from the A2 phase of the Early Pre-Roman Period to the beginning of the Migration Period, with iron specimens occurring throughout that time, whereas copper alloy specimens are found primarily in complexes from the Older Roman Period.

In the Early Pre-Roman period, hooked pins are found in the eastern zone of the Przeworsk culture. In the Roman Period, hooked pins appear almost throughout the entire territory of the Przeworsk culture, but are still more common in its eastern part. The results of the anthropological analysis indicate that in the vast majority of cases, hooked pins constituted equipment in graves of women, or in mass graves where at least one woman was buried. In the graves of children and men, pins were rarely found. This observation is also confirmed by the results of the analysis of the co-occurrence of the hooked pins with monuments considered to be archaeological indicators of gender. Approximately 80% of graves containing such hooked pins contain equipment typical for female burials. Therefore, it seems that researchers interpreting the hooked pins as the remains of spindles are right (Dąbrowska 1974, 232–233; 1997, 99; 2008, 35; Godłowski 1977, 41; Schuster 2010, 757; Maik 2012, 57–59). Much less convincing are the hypotheses assuming that the hooked pins served as ornaments or as a part of a costume.

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The Medieval Christian Necropolis in the Kopachyntsi hillfort (Ukraine). Unpublished Research Materials

Abstract

Lutsyk I. 2021. The Medieval Christian Necropolis in the Kopachyntsi hillfort (Ukraine). Unpublished Research Materials. *Analecta Archaeologica Ressoviensia* 16, 125–145

The article deals with unpublished research materials from the medieval Christian cemetery located on the territory of the hillfort in the village of Kopachyntsi in Sub-Carpathian region (Ukraine) which were conducted in 1953. Excavations were verified, objects and artefacts were analysed, and an attempt to attribute and date them was made. The site is represented by inhumations in pits, as well as burials under stone slabs. The so-called "under the slab burials" are a separate category of monuments of funeral culture, which is characterized by its diffusion only on the territory of Halician-Volhynian state, but not the whole of Kyiv Rus'. At the same time, such monuments are known in Slovakia, Czech Republic, Germany, Bulgaria, Romania, Macedonia and Poland. Data on most of the under the slab monuments discovered on the territory of Ukraine are often uninformative, and therefore the publication of the results of stationary archaeological excavations is extremely important for understanding this cultural and religious phenomenon. Special attention is paid to a rare stone cross that was found by the deceased. The search for analogies allows us to conclude that it may be a pilgrimage relic.

Keywords: Sub-Carpathian region, burial, funeral culture, under the slab burial, pilgrimage relics.

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History of the research

In 1949, the Upper Dniester (Verkhnyodnistryanska) expedition of the Lviv Department of the Institute of Archaeology of Academy of Sciences of USSR (now the Department of Archaeology of I. Krypiakevych Institute of Ukrainian Studies of National Academy of Sciences of Ukraine) led by Oleksiy Ratych carried out archaeological surveys on the right and left banks of Dniester River on the territory of Ternopil and Ivano-Frankivsk regions. As a result of these studies, a number of archaeological sites of different periods were discovered (Ratič 1949; 1955b, 158–164). Among them, in particular, hillfort mentioned by Bogdan Janusz in 1918 (Janusz 1918, 124) but not explored, located in Horodyshche Place (also known as Perekopy Place) north of the village of Kopachyntsi, Horodenka district, Ivano-Frankivsk region (then Chernelytsia district, Stanislaviv region) was examined (Fig. 1; Ratič 1955b, 163).

The hillfort, with an area of about one hectare, is located on the high right bank of the Dniester River, at an altitude of 300 meters above sea level (48°50'49"N 25°23'20"E). Its central part is surrounded by circular rampart. From the north, the hillfort is limited by precipitous bank of the river, from the southeast by a deep ravine and steep slopes. From the west the hillfort turns into a plateau. From this field side it is protected by three ramparts and ditches. At the same time rampart № 2 and ditches № 1 and № 2 extend up to the slope of the bank of the Dniester River. Another rampart (№ 4) located between the first and second lines of defence (Fig. 2; Ratič 1949, 12–13, 30–33; 1955b, 163) limits the middle part of the hillfort from the north. The length of the sides of the hillfort is about 150 × 150 × 176 m, while the height of the ramparts

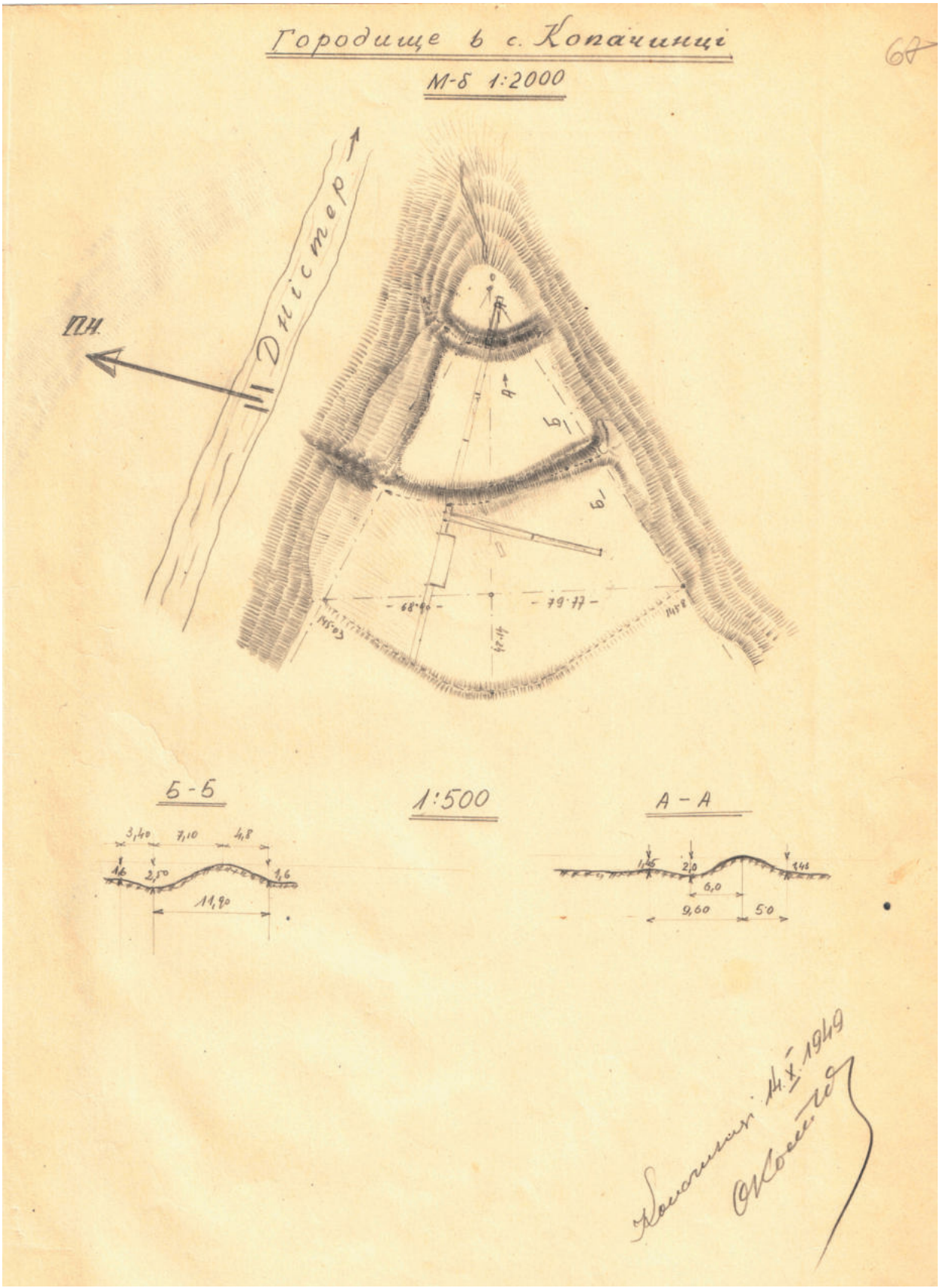
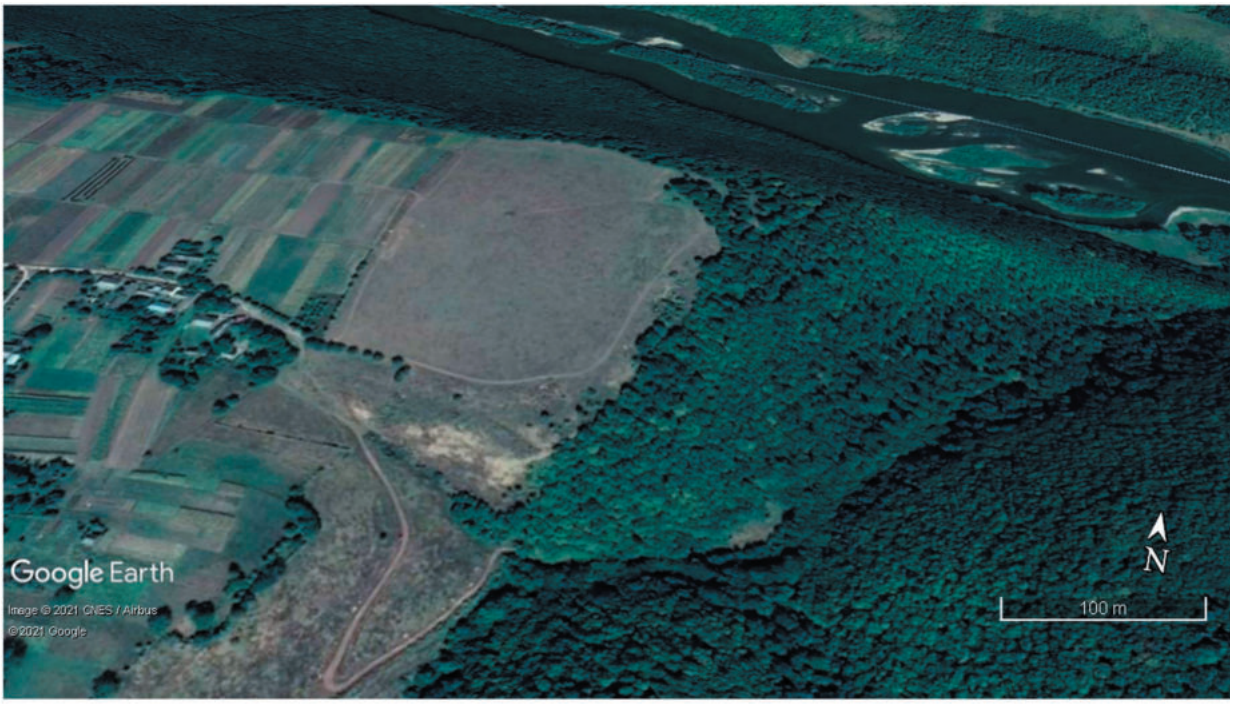


Fig. 1. Plan of the hillfort in Kopachyntsi (drawn by O. Kostyuk, 1949; after Ratič 1949).



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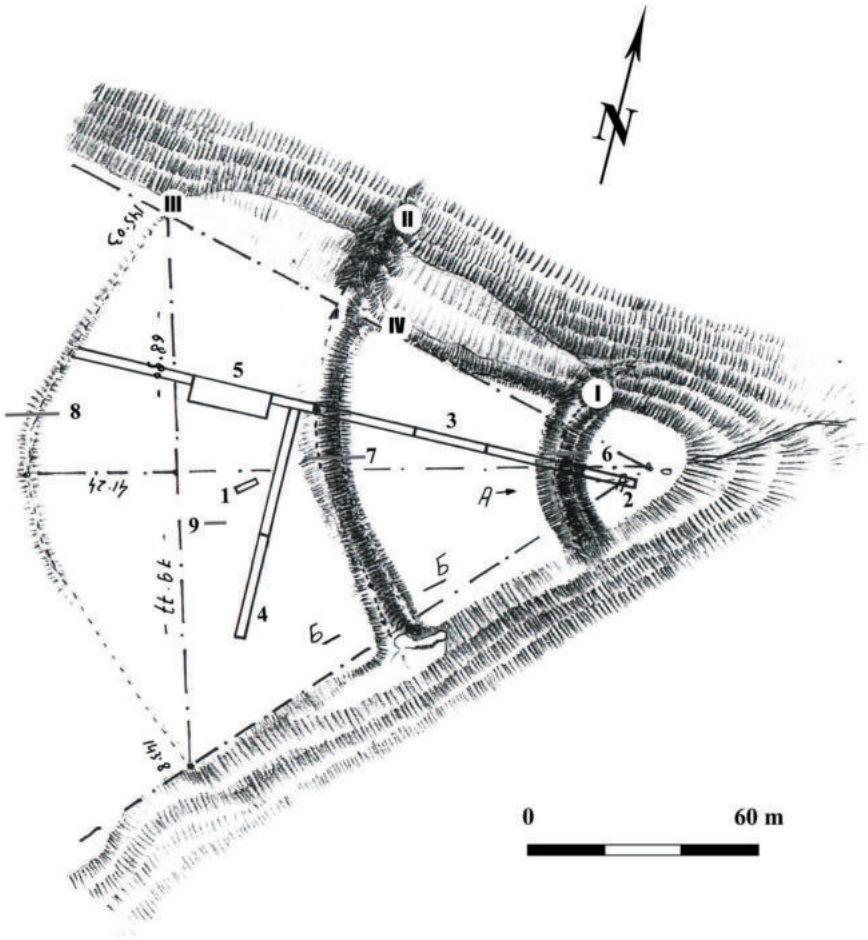

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Fig. 2. Kopachyntsi hillfort: 1 – view of the hillfort from the south; 2 – plan of the site (according to O. Kostyuk, 1949, with clarifications of the author of the article): 1 – trench of 1949 (?); 2 – trench A of 1953 (?); 3 – trench B of 1953 (?); 4 – trench of 1953 (?); 5 – excavation area № 1 of 1953; 6 – trench № 1 of 1988; 7 – trench № 2 of 1988; 8 – trench № 3 of 1988; 9 – trench № 4 of 1988 (after Ratič 1949, 31, plan; 1953, 2–3, 5, 8; Tomenčuk 1988, plan).

reaches 2.5 m, depth of the ditches up to 1 m.[1] At the time of surveying, the hillfort was used as pasture and arable field (Ratič 1949, 30–31).

As a result of research in 1949, surface surveys of the hillfort and the area west of it were conducted. A 5 × 1 m trench was laid down between the ramparts № 2 and № 3 (Ratič 1949, 31–33). A more detailed study of the site was continued in 1953 as a part of the activity of the Slavic detachment of Podillya archaeological expedition of the same Institute. On this occasion, three trenches were laid down[2] in the eastern (а – 20 × 1 m), central (б – 10 × 1 m), southern (в – 30 × 1 m) and one survey pit in western (г – 2 × 1 m) part of the hillfort, as well as one excavation area (20 × 6 m) in the northwestern part of the site (Ratič 1953, 2–8).

As a result, materials from Palaeolithic, Neolithic, Eneolithic, Bronze Age, Early Iron Age, the first centuries AD, 7–9th centuries and 10–12th centuries were collected (Ratič 1949; 1953). O. Ratych noted that *Excavations carried out in 1949 and 1953 in the eastern and middle parts of the hillfort did not provide continuous cultural layer of ancient Rus', but found only mixed archaeological material belonging to different cultures* (Ratič 1957, 477). Instead, an inhumation burial was discovered within excavation area № 1 in north-western part of the hillfort located between second and third defensive ramparts. According to the researcher's conclusions, the necropolis was planned on the place of a settlement, existing on this territory. Based on the grave goods found in the burials, the scientist dated the necropolis to the 11–12th centuries (Ratič 1953, 26).

In 1988, Bohdan Tomenchuk carried out small-scale surveys of the site. The archaeologist cut the ramparts № 1–3 and carried down a trench (№ 4) in the southern part of the third platform. The researcher noted that the cultural layer on the hillfort is only 0.1–0.2 m, and it was not possible to record it at all on the fortified platform № 1 (Tomenčuk 2006, 95). In the southern part of the hillfort, between ramparts № 2 and № 3, in the trench № 4, the archaeologist pointed to minor remains of stone foundations of wooden building, in his opinion, presumably for church purposes and a pit, covered with large stone slabs (Tomenčuk 1988, 21–22; 2006, 95; 2008, fig. 308). However, it should be noted that no detailed research was carried out in this area and that there is also no comprehensive documentation. Regarding the chronology of the site, Tomenchuk dates the Kopachyntsi hillfort to 12–13th centuries, and the burial complex discovered in 1953 – to second half of the 12th century. At the same time, based on the cross section of earthen fortifications, B. Tomenchuk concludes that rampart № 3 was constructed in the beginning of the 13th century, and as a result – burial complex was separated from the suburb and thus the third platform of the hillfort was formed (Tomenčuk 1988, 21–22; 2006, 94–95).

As a result of the examination of the surrounding area, Tomenchuk recorded that a large (2 ha) synchronous settlement had been situated nearby the hillfort. Two other settlements are located on its outskirts in Monastyrok Place and Selyshche Place (Tomenčuk 2006, 95).

In general, the results of these studies have only been published briefly in scientific literature (Ratič 1955a; 1957, 47–48; 1976, 175–176; Tomenčuk 2006, 94–95; 2008, fig. 308, 308.1, 308.2), and therefore require careful review and analysis. This primarily applies to studied necropolis that was studied on a larger area.

Analysis of ceramic material

Ceramic ware belongs to the mass of archaeological material discovered during 1949 and 1953 on the territory of the Kopachyntsi hillfort and a significant part of it was collected during research within excavation area № 1. In order to verify its chronology, and hence to date the hillfort and burial complex discovered on its territory, it became necessary to analyse this group of finds.[3]

With minor differences, the discovered ceramics generally have the same features. Pots were made of well cleaned clay with admixtures of mainly fine-grained sand. Their surface is regular and rough. The firing is mostly uniform (sometimes with grey and white spots) from brick and beige to dark grey colour. The firing is mostly three-layered (brick and beige colours of outer and inner surfaces and grey at the break), less single-layered (grey). The texture is dense, with a wall thickness within 3–8 mm. The number of ornamented ceramic ware is significant in the analysed collection. The in-depth decor, which usually covered shoulders of the pots, often to their full height, is represented by straight-line motifs made

[1] According to B. Tomenchuk their height is: rampart № 1 – 1.7 m; № 2 – 0.8 m; № 3 – 1 m.

[2] In the reporting documentation all of the trenches are called survey pits.

[3] I express my sincere gratitude to Vira Hupalo, Senior Researcher of the Department of Archaeology of the I. Krypiakevych Institute of Ukrainian Studies of the National Academy of Sciences of Ukraine for the help in its processing.

by a multi-toothed stamp. At the same time, it is worth noting that wave motifs and notches also appeared in the ornament.

The shape of the rims of the ceramic ware is represented by four models: 1 – cylinder-faceted (81.8%) (Fig. 3–6), cylinder-cuff (9.1%), faceted (6.8%) (Fig. 7), tab (2.3%). Quantitatively, cylinder-faceted shape of the rims is dominant. Within the latter type, ornamented rims of one of the pots stand out. The central part of the rims of single-layer grey pots, cut obliquely to the outside, are decorated with vertical dimples, slightly tilted to the right (Fig. 3: 3). Cylinder-faceted shape of the rims began to appear only at the end of 11th century and became widespread during the first half of 12th century, or precisely during the main phase of the hillfort, at least within the examined area.

The ceramic material discovered during archaeological excavations carried out by B. Tomenchuk in 1988 on the territory of the hillfort and its outskirts does not contradict these conclusions (Fig. 8; Tomenčuk 2008, fig. 308.2).[4]

Cemetery

This was discovered within the excavation area № 1 (20 × 6 m, dug to a depth of 1 m). According to Ratych, the cemetery appeared on the site of a previously existing settlement; at the same time *density of burials completely destroyed cultural layer and did not allow to establish archaeological stratigraphy* (Ratič 1953, 22, 26). The cemetery is represented by 33 inhumation burials, several of which were covered with stone slabs (Fig. 9). Descriptions of each of them are represented below.

Burial № 1 – square 1 в, depth 0.19/0.32 m – head, 0.27 m – legs from the level of modern surface. Skeleton of a woman in supine position. Orientation southwest, facing south. Right hand on the chest, left one on the pelvis. Four small stones lay around the deceased. Skeleton not fully discovered, its lower part was in the wall of excavation. Length of discovered skeleton is 1.35 m. Grave goods are absent. Data on age and sex are provided by Ratych. There was no special anthropological study.

Burial № 2 – square 1 в, depth 0.36/0.44 m – head. Skeleton of a child. Other bones decayed. Grave goods are absent.

Burial № 3 – square 1 в, depth 0.32/0.44 m – head, 0.39 m – legs. Skeleton of a man, in supine position, length 1.8 m. Orientation southwest. Arms folded on the chest. Stone lies near the feet. Grave goods are absent.

Burial № 4 – square 1 в, depth 0.36/0.48 m – head, 0.5 m – legs. Skeleton of a woman, in supine position, length 1.75 m. Orientation southwest, facing south. Right hand on the belly, left on the pelvis. A ring was found on the finger of her right hand (Fig. 10: 3).

Burial № 5 – square 1 б/2 б, depth 0.25/0.37 m – head, 0.44 m – legs. Skeleton of a child, length 1 m in supine position. Orientation southwest. Arms extended along the body. Small stone placed under the head. Grave goods are absent.

Burial № 6 – square 1 б, depth 0.31/0.45 m – head, 0.36 m – legs. Skeleton of a woman, in supine position, length 1.76 m. Orientation southwest, facing north. Right hand on the belly; left one extended along the body. Small stone located behind the skull. Small bronze body cross with eyelet was found near neck on a depth of 0.52 m (Ratič 1953, 10, photo № 14).

Burial № 7 – square 1 а/б and 2 б, depth 0.2/0.31 m – head, 0.38 m – legs. Skeleton of a woman (possibly), in supine position, length 1.7 m. Orientation southwest. Arms extended along the body. Skull is broken, bones partially shifted from their original places. Small stone cross was found near the neck on a depth of 0.51 m (Fig. 10: 1).

Burial № 8 – square 1 а/2 а, depth 0.4/0.5 m – head, 0.55 m – legs. Skeleton of a man, in supine position, length 1.78 m. Orientation west, facing north. Arms extended along the body. Grave goods are absent.

Burial № 9 – square 3 б, depth 0.32/0.41 m – head, 0.48 m – legs. Skeleton of a woman, in supine position, length 1.77 m. Orientation west, facing north. Arms extended along the body. Four stones located near legs. Grave goods are absent.

Burial № 10 – square 3 б, depth 0.31/0.41 m – head. Skeleton situated not in anatomical order. Skull located on the place of pelvic bones. In general bones were found on an area of 1.3–1.4 × 0.3–0.4 m. Destroyed by burial № 11. Stone is located south of burial № 10. Grave goods are absent.

Burial № 11 – square 3 а/3 б and 4 б, depth 0.38/0.47 m – head, 0.39 m – legs. Skeleton of a man, in supine position, length 1.7 m. Orientation southwest. Right hand on the belly left on the pelvis. Small pile of stones located from the north. Grave goods are absent.

Burial № 12 – square 2 а/3 а, depth 0.43/0.53 m – head, 0.5 m – legs. Skeleton discovered partially. Orientation southwest. Two rings made of silver wire were found near fingers on a depth of 0.5 m (Fig. 10: 2–2.1).

[4] Information about results of this research very limited.

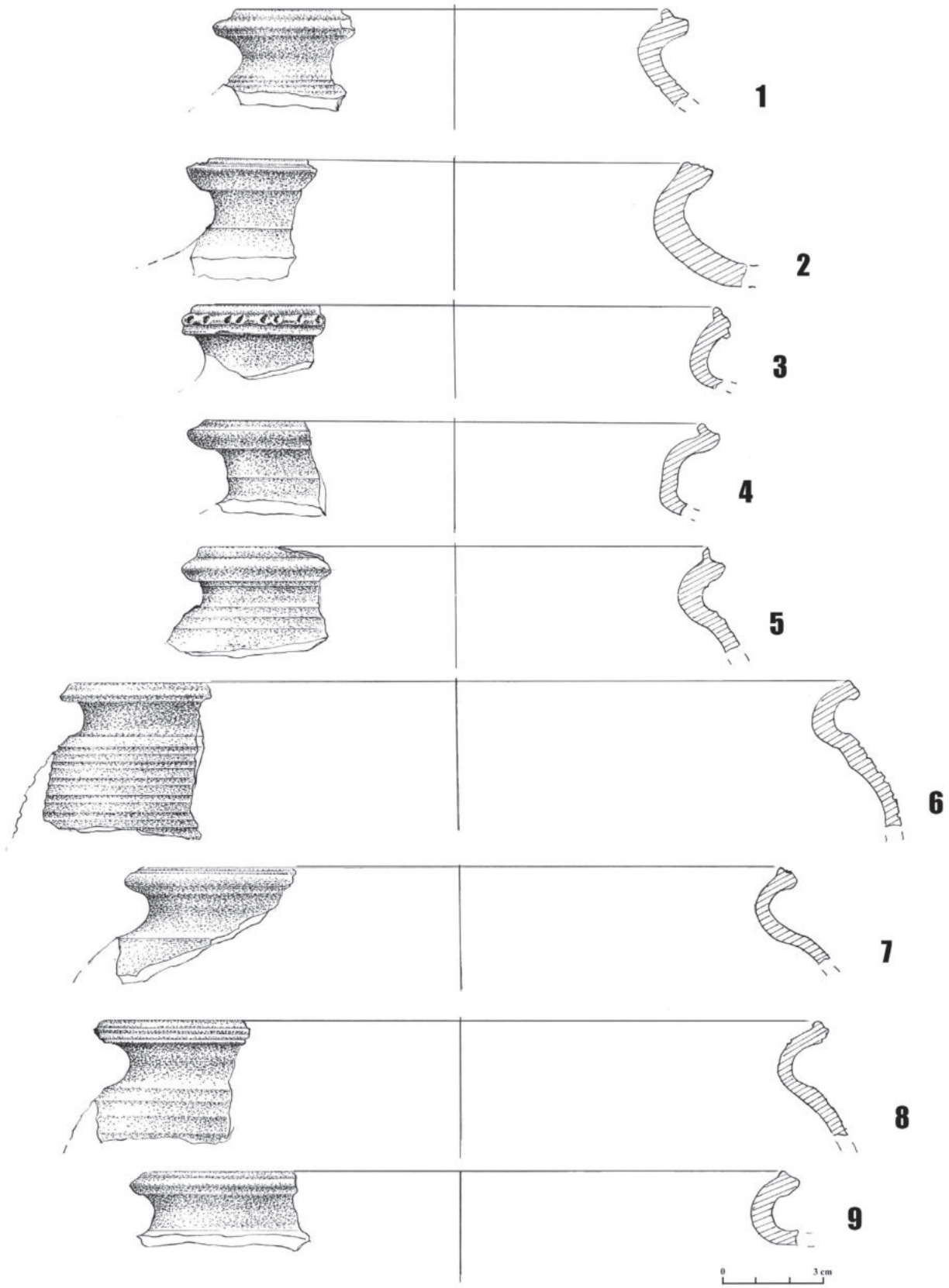

Fig. 3. Selection of ceramic shards. Excavation area № 1 (drawn by I. Prynada, 2021).

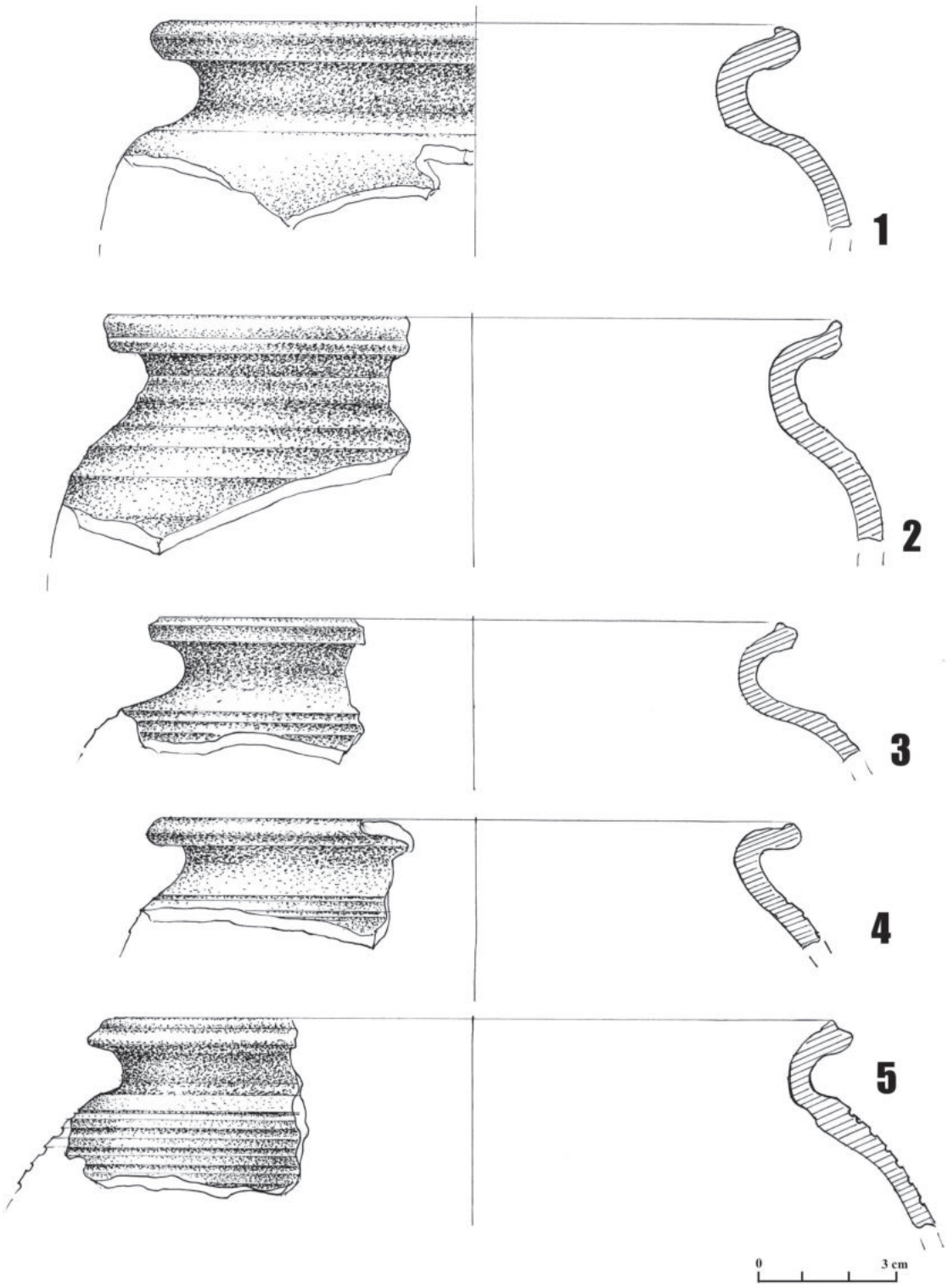

Fig. 4. Selection of ceramic shards. Excavation area № 1 (drawn by I. Prynada, 2021).

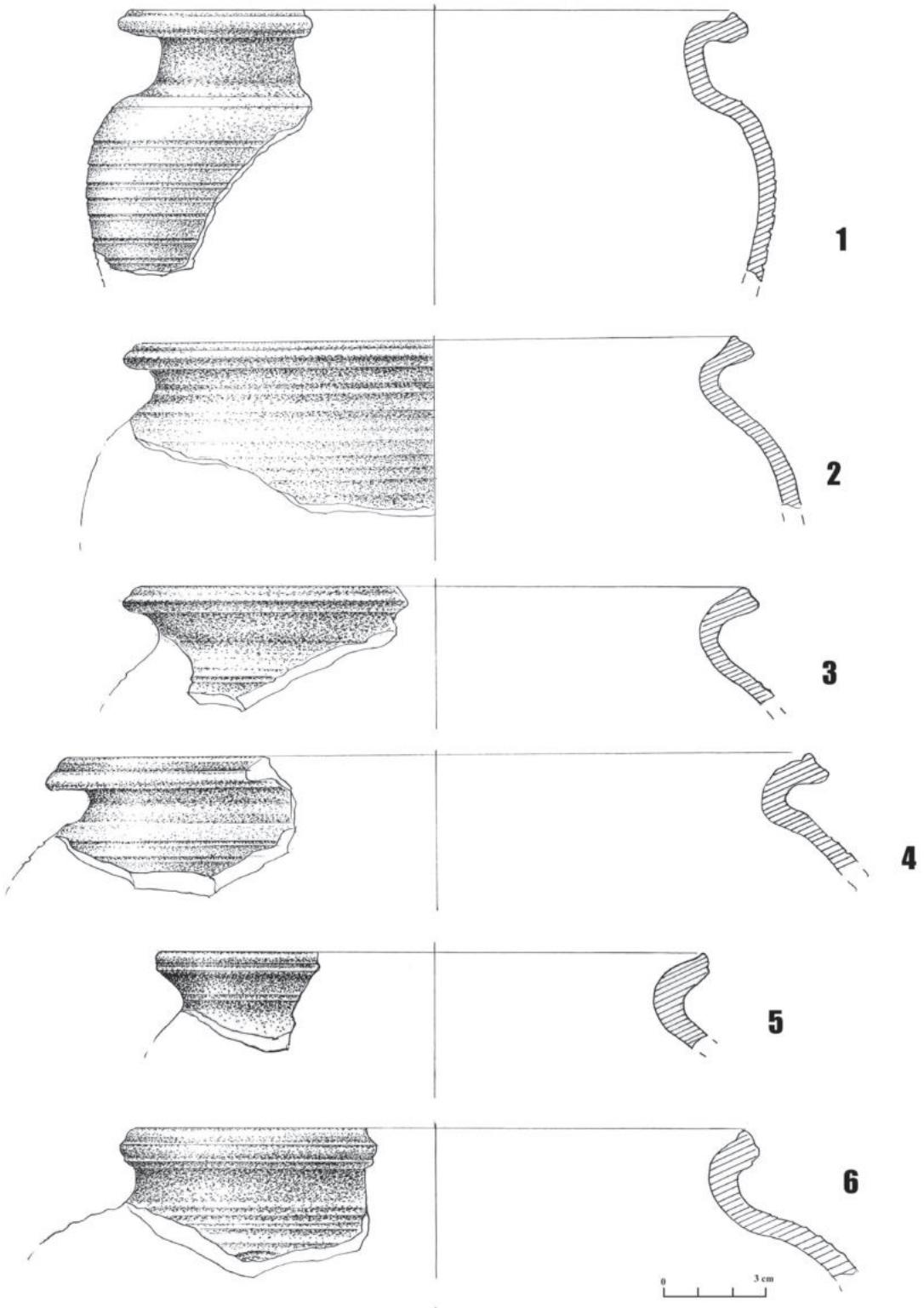

Fig. 5. Selection of ceramic shards. Excavation area № 1 (drawn by I. Prynada, 2021).

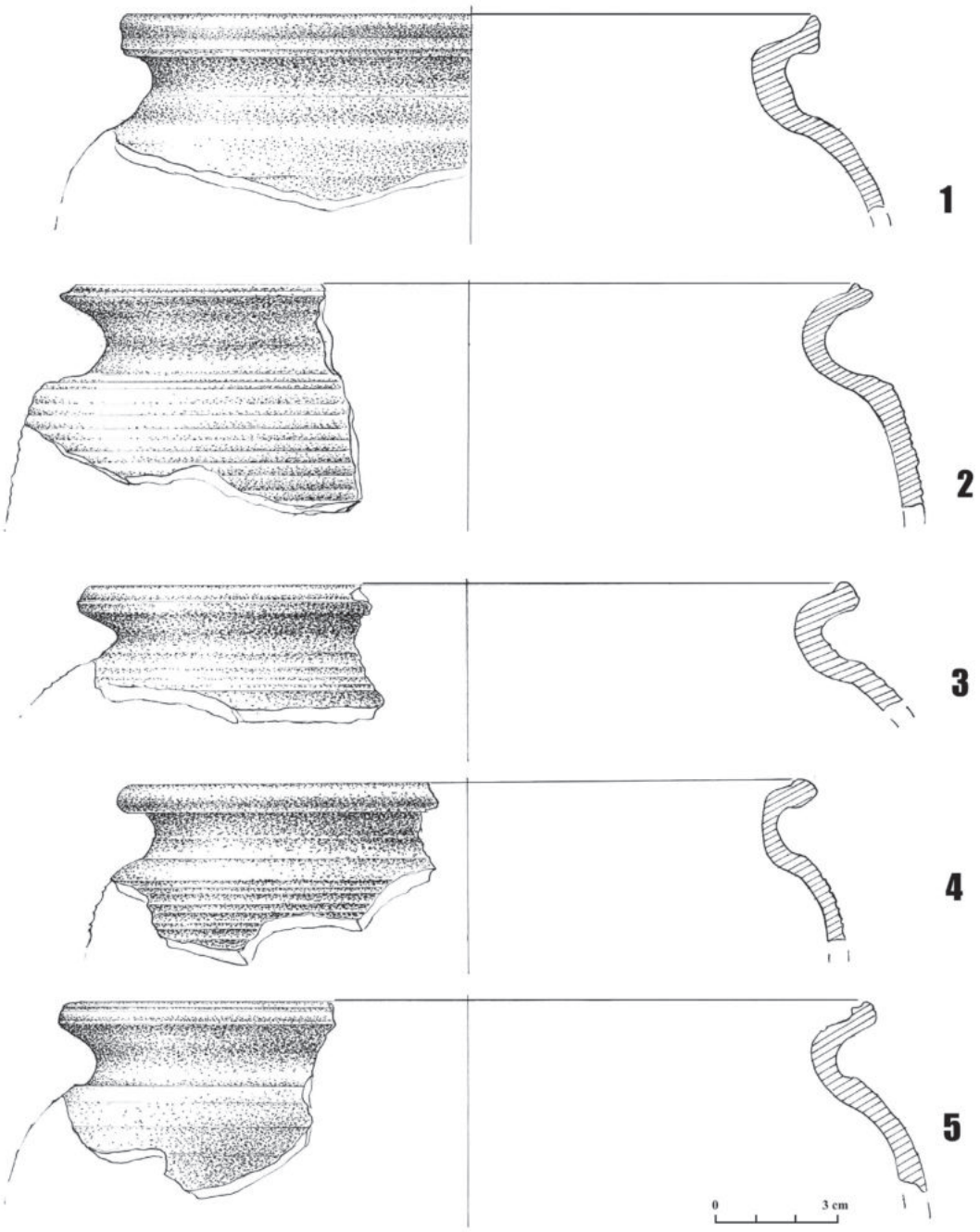

Fig. 6. Selection of ceramic shards. Excavation area № 1 (drawn by I. Prynada, 2021).

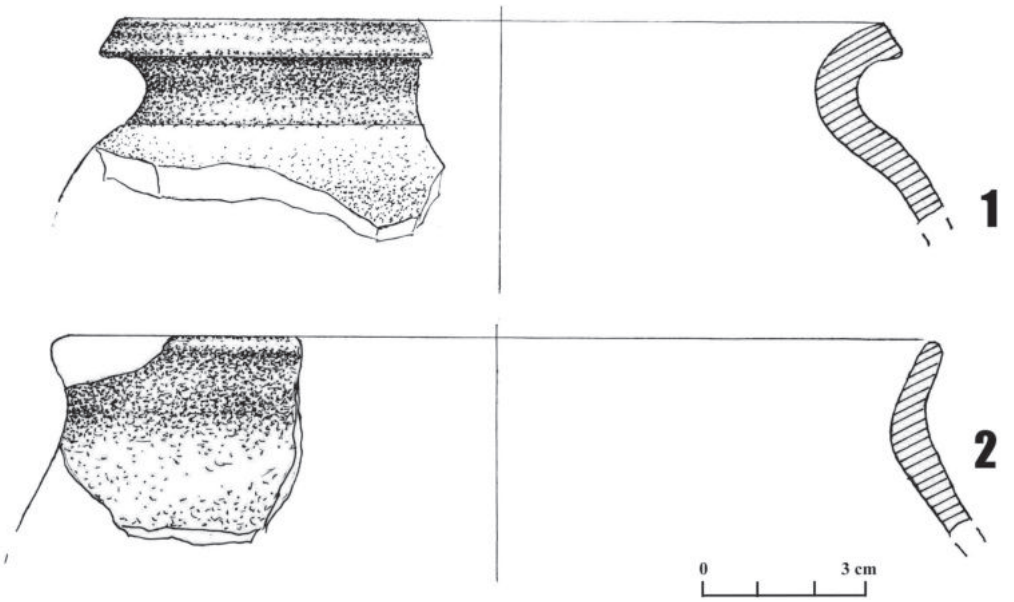

Fig. 7. Selection of ceramic shards. Excavation area № 1 (drawn by I. Prynada, 2021).

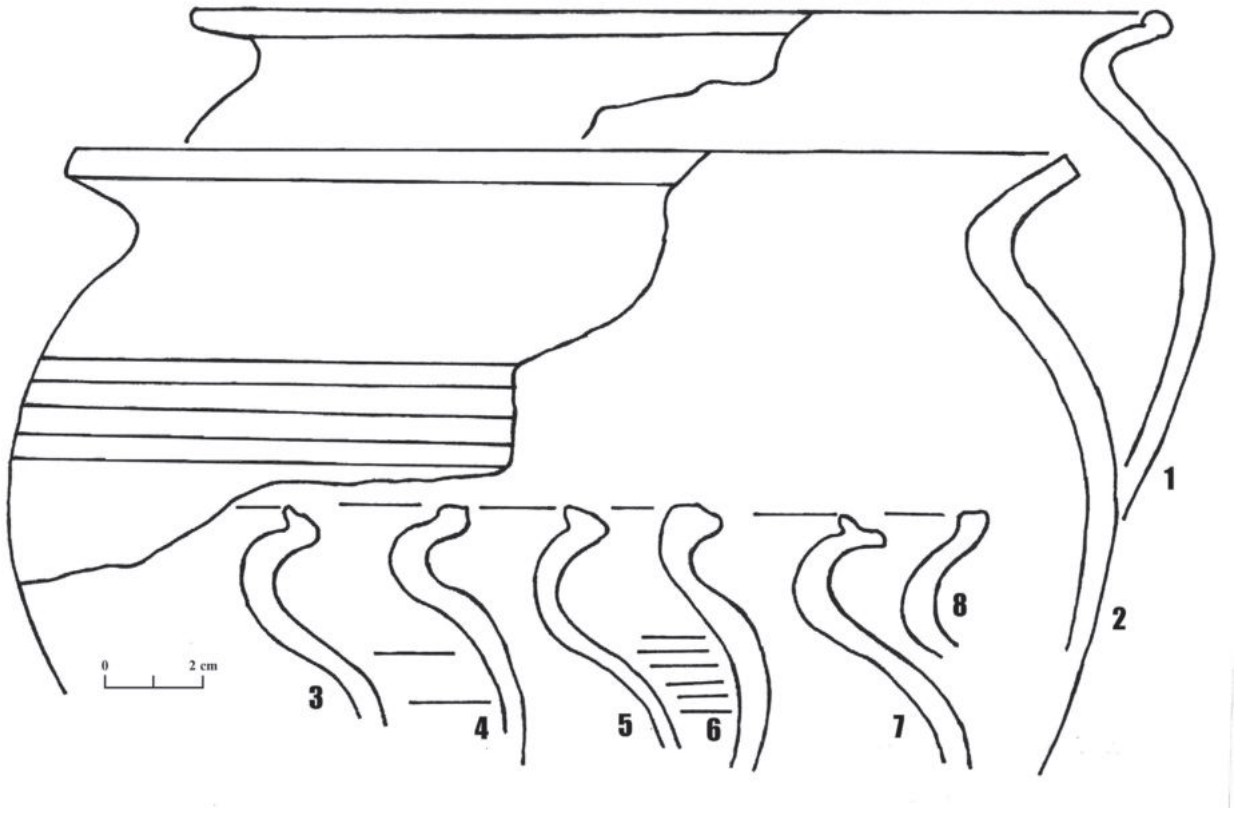

Fig. 8. Ceramic shards from the excavations of B. Tomenchuk at the Kopachyntsi hillfort in 1988 (after Tomenčuk 2008, 452).

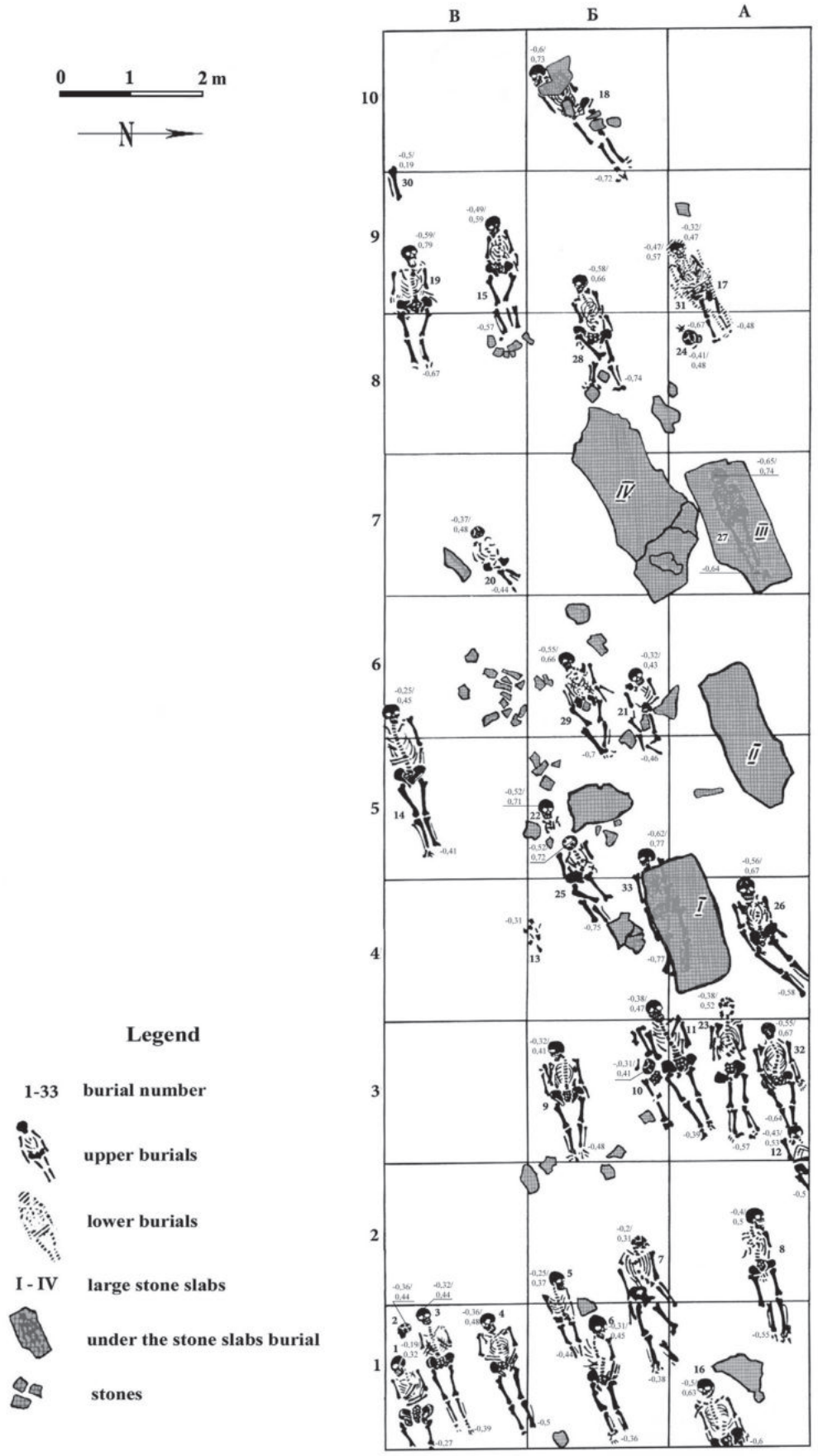

Fig. 9. Excavation area № 1. The cemetery (according to Ratič 1953 with clarifications of the author of the article).

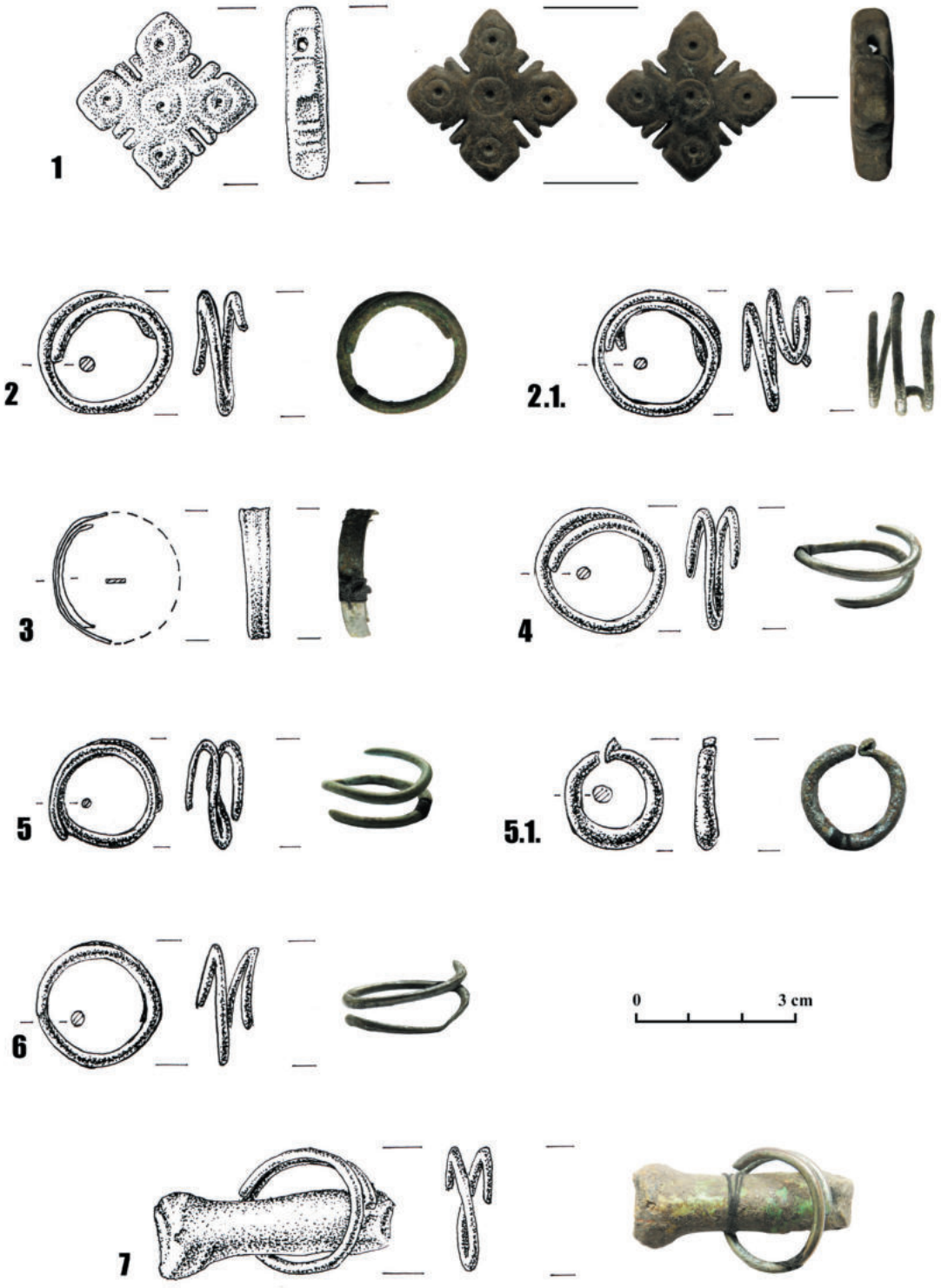

Fig. 10. Grave goods: 1 – cross from the burial № 7; 2–2.1 – rings from the burial № 12; 3 – ring from the burial № 4; 4 – ring from the burial № 17; 5 – ring from the burial № 20; 5.1. – s-shaped temple ring from the burial № 20; 6 – ring from the burial № 23; 7 – ring from the burial № 31.

Burial № 13 – square 4 б/4 в, depth 0.31 m. Skeleton of a child preserved as small pieces of bones. Grave goods are absent.

Burial № 14 – square 5 в/6 в, depth 0.25/0.45 m – head, 0.41 m – legs. Skeleton of a man, in supine position, length 1.85 m. Orientation southwest. Right hand on the belly, left on the pelvis. Stone located west of the head. Grave goods are absent.

Burial № 15 – square 8 в/9 в, depth 0.49/0.59 m – head, 0.57 m – legs. Skeleton of a woman (probably), in supine position, length 1.71 m. Orientation southwest, facing south. Right hand on pelvis, left extended along the body. Bones are partially displaced from their original places. Pile of small stones located near the legs on a depth from 0.42 to 0.57 m. Grave goods are absent (Ratič 1953, 12, photo № 13).

Burial № 16 – square 1 а, depth 0.5/0.63 m – head, 0.6 m – central part of a skeleton. Skeleton discovered complete. Skeleton of a woman in supine position. Orientation southwest. Arms extended along the body, partially under the pelvic bones. West of the burial, on a depth from 0.13 to 0.33 m flat triangular stone located. Grave goods are absent.

Burial № 17 – square 8 а/9 а, depth 0.32/0.47 m – head, 0.48 m – legs. Skeleton of a woman, in supine position, length 1.52 m. Orientation southwest. Hands are on the pelvis. Between legs near pelvic bones on a depth of 0.47 m, a ring was found (Fig. 10: 4).

Burial № 18 – square 10 в, depth 0.6/0.73 m – head, 0.72 m – legs. Skeleton of a man in supine position, length 1.85 m. Orientation southwest, facing south. Hands on the pelvis. From above skeleton covered by pieces of cracked stone slab, which is located on a depth from 0.14 to 0.4 m from the modern surface. Grave goods are absent.

Burial № 19 – square 8 в/9 в, depth 0.59/0.79 m – head, 0.67 m – legs. Skeleton of a woman, in supine position, length 1.65 m. Orientation southwest. Arms extended along the body.

Burial № 20 – square 7 в, depth 0.37/0.48 m – head, 0.44 m – legs. Skeleton of a child in supine position, length 1 m. Orientation southwest. Preservation of skeleton is poor. Position of hands is unknown. Bones are partially removed from their original positions. Silver s-shaped temple ring was found near the neck on a depth of 0.5 m. Near the fingers of the right hand, on a depth of 0.61 m, a ring was found (Fig. 10: 5–5.1). Also, presence of iron artefact, probably a nail, as suggested by O. Ratych. This item was not found in museum collection. About 0.23 m south from burial on a depth from 0.3 to 0.35 m flat rectangular 0.5 × 0.25 m stone located, and north from burial on distance of 1.5 m large white flat slab of 2.76 × 0.96–1.18 × 0.04–0.07 m was recorded.

Burial № 21 – square 5 б/6 б, depth 0.32/0.43 m – head, 0.46 m – legs. Skeleton in supine position. Bones are partially removed from their original positions. Orientation west. Hands are on the pelvis. Grave goods are absent. Over the skeleton in the central part three stone slabs located in the direction from southeast to northwest. First from the south was at a depth of 0.1/0.17 m, medium one – of 0.27/0.3 m and west one – of 0.23 m. On both sides of the head small pieces of rotten wood, apparently remains of a coffin, were found (Ratič 1953, 13–14).

Burial № 22 – square 5 б, depth 0.52/0.71 m. Skeleton of a child. Orientation west. Preservation of bones is poor, they are almost decomposed. Around and above the burial six fragments of small stone slabs on a depth from 0.45 to 0.7 m were found. North of the burial rectangular slab of 0.9 × 0.6 m on a depth of 0.14/0.27 m located. Skeleton is destroyed by burial № 25. Grave goods are absent.

Burial № 23 – square 3 а/4 а, depth 0.38/0.52 m – head, 0.57 m – legs. Skeleton of a man in supine position, length 1.78 m. Orientation west. Hands folded on the chest. On a finger of right hand, on a depth of 0.58 m, a ring was found (Fig. 10: 6).

Burial № 24 – square 8 а, at the feet of burial № 17. Only the skull has been preserved at a depth of 0.41/0.48 m and several bones near it. Orientation west. Grave goods are absent.

Burial № 25 – square 4 б/5 б, depth 0.52/0.72 m – head, 0.75 m – legs. Skeleton in supine position. Orientation southwest. Bones are partially removed from their original positions. In the middle part of the pit, on a depth of 0.72 m, a ring was found. On the right, over the head, stone slab near burial № 22, mentioned above, was found. Over the legs on a depth from 0.24 to 0.29 m three little stones were placed one on the other.

Burial № 26 – square 4 а, depth 0.56/0.67 m – head, 0.58 m – legs. Skeleton of a man in supine position, legs partially shifted to the right, length 1.7 m. Orientation southwest. Arms extended along the body. Three small stones located near the legs on a depth of 0.4 m. Grave goods are absent.

Burial № 27 – square 7 а, under large pink stone slab of 1.97 × 1 × 0.12 m; were found on a depth of 0.65/0.74 m – head, 0.64 m – legs. Skeleton of a man in supine position, length 1.62 m. Skeleton is crushed. Orientation southwest. Right arm extended along the body, left on the pelvis. Stone slab lies obliquely, its north part – on a depth of 0.37/0.57 m, north one – on

a depth of 0.04/0.14 m from modern surface. Grave goods are absent.

Burial № 28 – square 8 б/9 б, depth 0.58/0.66 m – head, 0.74 m legs. Skeleton of a woman in supine position, length 1.6 m. Orientation southwest, facing south. Arms extended along the body. Bones are partially displaced from their original position. Several stones were found near the legs. Grave goods are absent.

Burial № 29 – square 5 б/6 б, depth 0.55/0.66 m – head, 0.7 m – legs. Skeleton of a man in supine position, length 1.64 m. Orientation southwest, facing south. Arms extended along the body. Bones are partially displaced from their original position. Around the head and above it two big stones were found and a pile of stones located north of it, all on a depth of 0.19–0.5 m. Grave goods are absent.

Burial № 30 – discovered in the south wall of excavation trench in squares 9 в/10 в on a depth of 0.5 m (probably it referring to a burial pit). Only a bone of left leg on a depth of 0.19 m was found on the discovered area.

Burial № 31 – square 8 a/9 a, depth 0.47/0.57 m – head, 0.67 m – legs, under burial № 17. Skeleton of a woman in supine position, length 1.64 m. Orientation southwest, facing south. Right arm extended along the body, right hand on the pelvis. On the pelvic bones, on a depth of 0.73 m, a ring was found (Fig. 10: 7).

Burial № 32 – square 3 a, depth 0.55/0.67 m – head, 0.64 m – legs. Skeleton of a man in supine position, length 0.75 m. Orientation southwest, facing east. Right hand on the pelvis, left arm extended along the body. Grave goods are absent.

Burial № 33 – square 4 a/4 б/5 б, under large – 1.9 × 0.8 × 0.15 m – stone slab on a depth of 0.62/0.77 m – head, 0.77 m – legs. Skeleton of a woman in supine position, length 1.7 m. Orientation southwest, facing south. Left hand on the belly, right one on the pelvis. Grave goods are absent (Ratič 1953, 8–17).

Analysis of discovered objects

The graves are located in six distinct rows, at a distance of about 1 m from each other. In one case, this distance is 0.3 m. Distance between the graves in a row varies and ranges from 0.15 to 1.3 m. All burials are made in rectangular pits (Ratič 1953, 17) at a depth from 0.27 to 0.79 m from the level of modern surface. Some burials were covered with stone slabs (burials № 18, 27, 33). However, the location of the slabs at different depths (burial № 18: 0.14–0.4 m or burial № 27: north part of the slab 0.37/0.57 m, and south one – 0.04/0.14 m) indicate that they were partially shifted from their original places. Another two slabs (№ 4 and № 2) were moved from the burials and located near them, and some of the others preserved only as separate fragments of stone, probably the result of ploughing (Fig. 9).

Burials № 20 and № 21 were most likely made in coffins, with a fragment of a nail (?)[5] and the remains of wood, respectively, having been preserved. Several fragments of this wood were sent for analysis to determine the species to which it belongs. Analysis was conducted by Maryna Serhieieva,[6] and as a result, five wood samples were taken. They all represent trunk wood and tree species was defined according to the features of microstructure by three sections, followed by a comparison of the results with data of the definitions of wood. The detected remains are defined as coniferous wood, probably pine (*Pinus* sp.).

According to Serhieieva the wood belongs to a species characteristic for local flora. Due to its very small size and conditions of preservation, definition of this wood as a pine can be accepted with some caution, but such an identification does not contradict its traditional use as a raw material for burial constructions from Middle Ages to Modern period (Sergêêva 2021).

Most of the deceased were found in a supine position and oriented mainly southwest and west. The bones of some of the deceased were recorded as not being in their correct anatomical position. A stone "pillow" was recorded under the head in burials № 5, № 6 and near the legs in burials № 3 and № 15. The presence of such objects in burials is often associated with the piety of the deceased or even with monastic dignity (Makarov 1981).[7] Instead, stones noted in the description of burials № 16 and № 22, and possibly № 29, according to stratigraphic observations, were a filler of the burial pit.

Eight variations of hand position were defined. Most often (9) both arms are straightened along the

[5] It was not found in museum collection.

[6] I express my sincere gratitude to M. Serhieieva, Senior Researcher of the Department of Archaeology of Kyiv, Institute of Archaeology of National Academy of Sciences of Ukraine, and specialist in the definition of species of archaeological wood, for the analysis conducted.

[7] Burials with stone and ceramic tile are often recorded in monastic cemeteries of the medieval and early modern periods. In Rus', they are known at least from the 11th century (Makarov 1981; Pivovarov 2006, 168). A detailed analysis of such burials in the territory of the Halician-Volhynian state shows that the deceased were of different sexes and ages, even children, so symbolized the piety of the deceased. Which is reflected in a number of written sources. More about this will be in my next article.

body (Tab. 1). Necropolis is represented by burials of deceased of different sexes and ages. However, it should be noted that no anthropologist was among the staff of the expedition.

Table 1. Position of the hands of the deceased from the Kopachyntsi cemetery.

№	1	2	3	4	5	6	7	8
Position of hands								
Woman	4	2	1		1		1	1
Woman (?)	1					1		
Man	3	2	1	2	1	1		
Child	1							
?			1					
Total number of burials	9	4	3	2	2	2	1	1

Grave goods were recorded within the examined burials but artefacts were only found in 9 of them (Fig. 10) (Ratič 1953). Unfortunately, not all of the material has been preserved in museum collections (burials № 6, № 20, № 25). They are mostly represented by rings made of silver (3) and bronze wire (3), twisted in one and a half turns, as well as lamellar silver ring (1), a braided silver ring (1), an s-shaped silver temple ring (1), crosses: bronze (1) and stone (1). A characteristic feature of Christian funerary sites on the territory of Rus' is the presence of grave goods mainly in women's (6) and not men's (1) burials. In two cases, the sex of the deceased was not established.

The ring from burial № 4 represents the lamellar type. It is made of silver, broken and preserved as two fragments. Plate width 4–5 mm. Thickness 1 mm (Fig. 10: 3).

All other finger decorations were represented by rings made of wire twisted into one and a half turns:

- burial № 12 – two silver rings, one of which has reverse loop. Diameter of the first one 23 mm, the second – 21 mm. Their thickness – 2 mm (Fig. 10: 2–2.1);
- burial № 17 – bronze ring. Diameter 23 mm, thickness 2 mm (Fig. 10: 4);
- burial № 20 – bronze ring. Diameter 19 mm, thickness 2 mm (Fig. 10: 5);
- burial № 23 – bronze ring. Diameter 23 mm, thickness 2 mm (Fig. 10: 6);
- burial № 31 – silver ring. Diameter 24 mm, thickness 2 mm (Fig. 10: 7).

Head decorations are represented by one s-shaped temple ring. Its diameter was 18 mm, and it had a thickness of 3 mm (Fig. 10: 5.1).

However, not all of the grave goods were found in museum collections. In particular, this is true of the cross from burial № 6 and the ring from burial № 25. Therefore, we present their descriptions according to Ratych. A two-armed cross with a square shield in the middle was found and, in the corners of the shield between the shoulders there are "point notches", and notches were made on the shoulders of the cross that do not reach the edges of the shoulders. The top of the cross has a round eyelet. Its dimensions are: height with an eyelet – 27 mm, width – 18 mm. The ring in question was braided from four silver wires and had riveted open ends. In its middle part the ring is thicker than at the edges, and it has a smooth surface. The diameter of the item – 24 mm (Ratič 1953, 19–21).

Most of the jewellery found belongs to the kind typical for the territory of Rus' and in general are widely dated back to the 11–13th centuries. However, the cross carved from grey stone which was discovered in burial № 7 stands out among them.

The cross is two-armed, made of grey, smooth stone. Its arms are straight with obliquely cut edges; the sides of each of them are cut to the centre. The middle part of the cross and arms on both sides of the product are decorated with a circular ornament. On both sides of each arm, ray-shape protrusions draw the eye. At the same time, these "rays" resemble the shape of a diagonal (saltire) cross. At the top of one of the arms there is a through hole – an eyelet for hanging the cross. The dimensions are the following: height of the cross – 33 mm, width – 32 mm, thickness – 7 mm (Fig. 10: 1).

According to preliminary conclusions,[8] the cross is made of steatite, deposits of which are known in northern Syria. Production and distribution of Christian relics made of this stone throughout the territory of Byzantium can be dated back to the 11–13th centuries (Musin and Petrov 2006, 12–13), Bulgaria – 12–13th centuries (Totev 1990). The appearance of steatite products on the territory of Rus' is associated with pilgrimages to the Holy Land (Musin and Petrov 2006; Musin 2010, 222–225; Gotun 2017, 112–126; Gupalo 2020, 488–490).

Circular ornamentation as an element of the decoration of Christian antiquities from the Byzantine Empire is known since the 5th century. It is interpreted

[8] There is no report from a geological expert at present.

as a symbol of the Divine Light of Jesus Christ (Fedorov 2017, 607–609).

Similar to Kopachyntsi are steatite crosses presented at the article written by Konstantin Totev. Studying these types of sites on the territory of medieval Bulgaria, the researcher in particular presented three crosses, even though their place of discovery has not been unambiguopusly determined. Similar features can also be traced on the cross from the 12–13th centuries found in Athens (Fig. 11: 2, 3; Totev 1990, 50, fig. 2: в, е, ж, з).

The closest analogies to the mentioned relic on the territory of Rus' are known from Old Ryazan and Novgorod. The first one is a bone cross (23.5 × 18 × 8 mm) from 11–14/16–17th centuries (according to the dating of the complex) (Fig. 11: 4). Alexander Ostapenko refers to it as lily-shaped (Ostapenko 2015, 160, fig. 80). A second slate cross (33 × 33 mm) from the 12th century was found in Novgorod (Fig. 11: 5; Kolčin *et al.* 1985, 140, fig. 264).

Mother-of-pearl pilgrimage crosses of the 12–13th centuries from Alahan Monastery in Isauria (Turkey), Atlit (Israel), Turaida (Latvia) and Great Tarnovo (Bulgaria) are vaguely similar (Musin 2010, 224–225; Gotun 2017, 124–126, fig. 2; 4: 14; 5: 7, 8; Spirġis 2018). Sub-triangular points of the arms with the protrusions and circular ornament or image of diagonal cross on the middle part of the cross are characteristic of all of them (Fig. 11: 6–9).

All these circumstances allow suggesting that the cross found in the burial № 7 of Kopachyntsi cemetery is probably a pilgrimage relic and according to analogies can be dated to within the 12–13th centuries.

The relatively long functioning of the burial complex in Kopachyntsi is probably evidenced by cases of the cross-section of burials. In particular, there are burials 0.25/0.37–0.44 m) and № 6 (0.31/0.45–0.36 m); № 10 (0.31/0.41 m) and № 11 (depth 0.38/0.47–0.39 m); № 22 (0.52/0.71 m) and № 25 (0.52/0.72–0.75 m). One more evidence – inhumation of one deceased over another: burials № 17 (0.32/0.47–0.48 m) and 31 (0.47/0.57–0.67 m). Therefore, at the time of the burial of the later deceased, surface marks probably no longer existed. Does it mean that no stone slabs were placed under the graves? It is very likely and at least there are no solid reasons to think otherwise. However, it is obvious that in general the number of burials covered by slabs was greater.

In general, on the territory of the Halician-Volhynian state, 84 sites with under-slab burial complexes were found. Information about most of them is extremely limited, so the introduction of materials from the cemetery in Kopachyntsi into scientific circulation is very important.

Under the stone slab burials are a separate group of sites of the funeral culture of the princely period. Largest number of them is concentrated in the territory among Dniester, Strypa, Zbruch rivers, as well as between the Dniester and Prut rivers. At least in Halych, Pitrych, Oleshkiv, Vasyliv, Sokilets, possibly in Plisnesk, and most likely in Peresopnytsia they were found in church cemeteries. In Vasyliv, Vikno, and Oleshkiv they were within the territory of sacral buildings.

These sites are characterized by a burial being made in a pit which was covered by a solid slab or several fragments of it, made of sandstone or limestone. Forms of the slabs are not always clearly visible; frequently they are not processed but close to rectangular, less often – oval. On this background, two anthropomorphic slabs from Vovkivtsi and Onut stand out. Slabs of an irregular shape were usually installed with their wider side to the shoulders, because of the physical characteristics of the person. In one case, carved cross-shaped signs, lines and notches were recorded on the surface of the slab from Borivtsi. The surface of the slab from Horodnytsia burial complex was decorated with a half-cylinder, carved in the middle. The dimensions of the slabs ranged within the following limits: length – 1–2.95 m, width – 0.5–1.6 m, thickness – 0.025–0.6 m, and did not always correspond to a height of deceased or athe size of burial pit. The level of the deceased in the grave is within 0.3–0.7 m from the level of the stone slab. In Mnishskyi Sad Place in Zalukva B. Tomenchuk discovered a burial under the wooden overlap (Lucik 2020a, 105–106; 2020b, 510, 525–534).

Small burial mounds have been recorded above the under the slab burials in Vovkivtsi, Ostap'ie, Velyka Plavucha, Staryi Zbarazh, and Velykyi Hlybochok. In Ostap'ie and Borivtsi, there was a circle around the burial, made of stones of different sizes. They are characterized by western, northwestern or southwestern orientation. Position of hands of the dead is represented by several variants, which corresponded to Christian ritual: both hands on the chest; right hand on the chest and left one extended along the body; right hand on the belly and left one extended along the body; right arm extended along the body and left one on the belly; right arm extended along the body and left one on the pelvis, as well as also in the position when both arms are extended along the body (Lucik 2020a, 106; 2020b, 516–523, 526).

A characteristic feature of under the slab burials is the location of individual graves in groups of two or

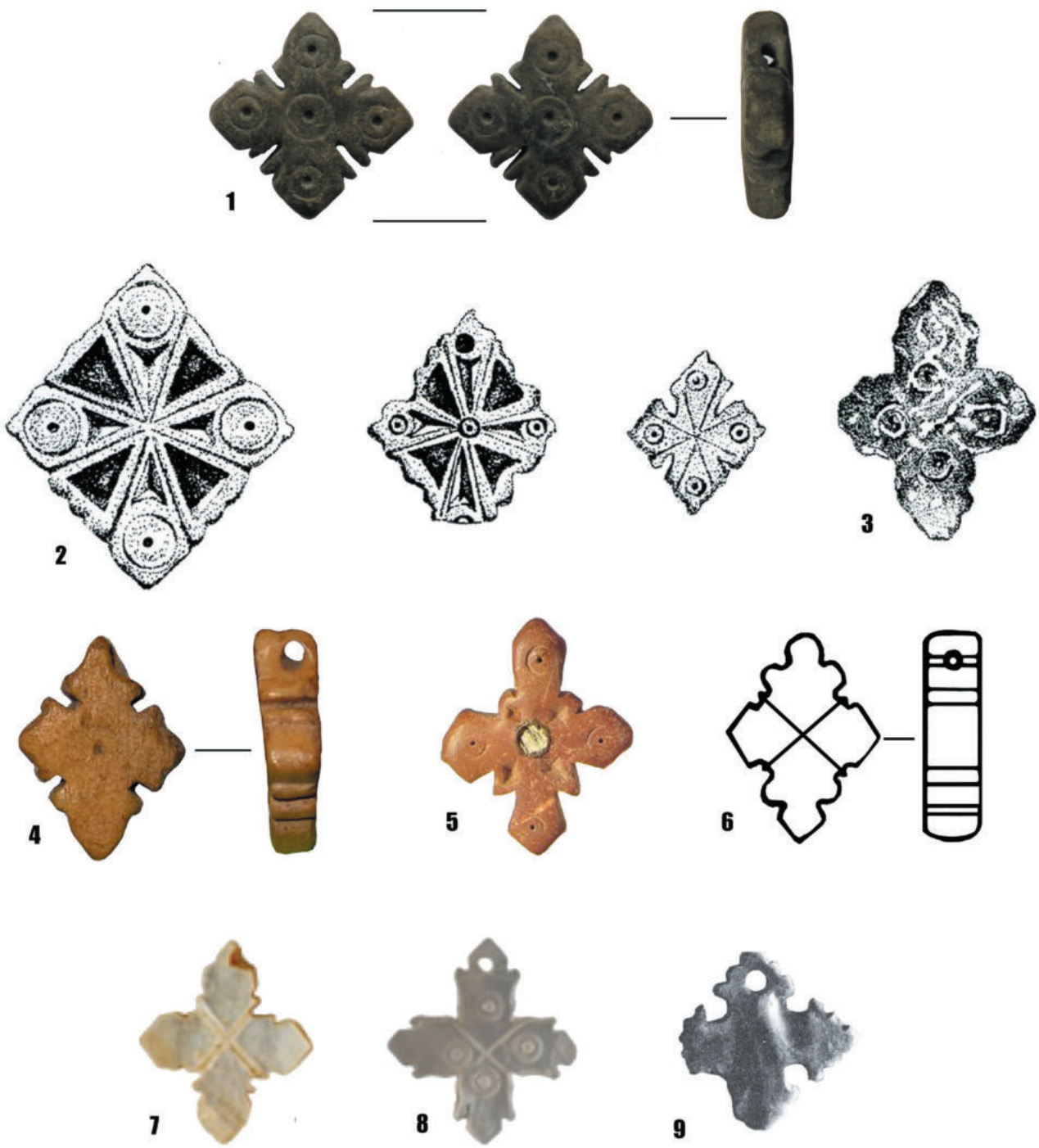

Fig. 11. Finds of similar crosses from other areas.

1 – Kopachyntsi's cross; 2 – crosses of unknown origin from the publication of K. Totev; 3 – Athens; 4 – Old Ryazan; 5 – Novgorod; 6 – Alahan Monastery in Isauria; 7 – Atlit; 8 – Turaida; 9 – Great Tarnovo.

Fig. 12. Under the stone slab burials on the territory of Halician-Volhynian lands.

1 – Peresopnytsia; 2 – Rivne; 3 – Tarakaniv; 4 – Peremyl; 5 – Plisnesk; 6 – Pidlyptsi; 7 – Luka; 8 – Zvenyhorod; 9 – Ostalovychi; 10 – Smilnytsia; 11 – Lapshyn; 12 – Urman; 13 – Plikhiv; 14 – Borshchiv; 15 – Verkhniakivtsi; 16 – Vovkivtsi; 17 – Horoshova; 18 – Dzvenyhorod; 19 – Ivankiv; 20 – Kryvche; 21 – Losiach; 22 – Monastyrok; 23 – Turylche; 24 – Ustia; 25 – Uvysla; 26–27 – Bedrykivtsi; 28 – Vynohradne; 29 – Blyshchanka; 30–31 – Horodok; 32 – Dzvyniach; 33 – Dobrivliany; 34 – Zelenyi Hai (Zhezhava); 35 – Zozulyntsi; 36 – Kasperivtsi; 37 – Kolodribka; 38 – Lysivtsi; 39 – Novosilka-Kostiukova; 40 – Pechorna; 41 – Stavky; 42 – Uhrynkivtsi; 43 – Hrytsivtsi; 44 – Staryi Zbarazh; 45 – Khomy; 46 – Velyka Plavucha; 47 – Dobrovody; 48 – Ostap'ie; 49 – Velykyi Hlybochok; 50 – Lozova; 51 – Pchapyntsi; 52 – Skomorokhy; 53 – Tovstoluh; 54 – Kosiv (Khom'iakivka); 55 – Kalynivshchyna; 56 – Palashivka; 57 – Liudvyshche; 58 – Shumsk (Onyshkivtsi); 59 – Horodnytsia; 60 – Kopachyntsi; 61 – Korniv; 62 – Yaseniv Pilnyi; 63 – Halych; 64 – Deleva; 65 – Khotymyr; 66 – Oleshkiv; 67 – Vasyliv; 68 – Vikno; 69 – Onut; 70 – Chunkiv; 71 – Buzovytsia; 72 – Makarivka; 73 – Oselivka; 74 – Borivtsi; 75 – Dubivtsi; 76 – Kulishivka; 77 – Kobolchyn; 78 – Mykhalkove; 79 – Perebykivtsi; 80 – Sankivtsi; 81 – Yarivka; 82 – Sokilets; 83 – Trepcha; 84 – Sanok.

three burials, which most likely indicates the family ties of the deceased. In three burials, the bottom of the pit was covered with charcoal. In one case, a skeleton located on a rough layer of burnt clay, and charcoal was found on its sides. The remains of a wooden coffin were found in 16 cases and nails were discovered in only 3 cases. In 7 cases, the skeleton was enclosed by a layer of lime, in two of them with marks of wooden structures (Lucik 2020a, 106; 2020b, 526–528).

The position of the dead in the grave – in a supine position, mainly oriented to the west (96), less often to the northwest (47), southwest (16), north (2), east (1) and south (1). Burials represent different sexes and ages of deceased. There are more than 20 variants of position of hands. In most cases, hands are folded: on the belly (42), extended along the body (22), on the pelvis (19), etc. The average height of all those buried is 1.66 m (including those of undetermined sex), women – 1.58 m, men – 1.66 m. In at least seven burials, so-called "stone pillows" were placed under the head of the deceased, in five they are located under the heads and near the legs, and twice only near legs. In one case, a handful of coal was discovered under the skull (Lucik 2020a, 106; 2020b, 510, 528).

Most of discovered burials are distinguished by rich grave goods, which are represented by a large assortment of jewellery, including ones, made of precious metals. In at least 13 cases, fragments of gold-woven brocade were excavated in the burials. At the same time their important feature is availability of grave goods, mainly in the women's burials. For example, on the cemetery in Sokilets I which has been studied in a comprehensive manner, among 40 discovered under the slab burials, grave goods were found in 12 cases in female burials and only in 3 – in male ones. At the same time, such pattern is noted not only in under the slab burials, but also in ordinary inhumations. Incidentally, in the same cemetery grave goods in general were found in 15 under the slab graves and 20 burials without any covering (Lucik 2020a, 106–107; 2020b, 528).

Besides the jewellery and elements of clothing, fragments of pottery or even in some cases whole vessels were found in the filler of burial pits. For example, in Plisnesk, small fragments of charcoal inside pots together with earth were found. Instead, pieces of coal found in small quantities in the burials most likely originated from thuribles used during the funeral ceremony (Lucik 2020a, 105–107; 2020b, 495–534).

As for the issue of the genesis of the practice of burial under stone slabs and why this rite was widespread mainly in the western part of Ukraine, with the exception of the under the slab cemetery in Buky, Kyiv region, no clear answer exists. There are several main hypotheses among researchers. They were identified first as separate categories by S. Pyvovarov: 1. Social and material – O. Ratych, J. Kalaga, M. Hanuliak (Ratič 1976, 176–177; Hanuliak 1979; Kalaga 2014, 136); 2. Ethnic, which suggests belonging of this type of burial to the tribes of Tyvertsi – B. Tymoshchuk, V. Siedov, V. Voinarovskyi (Timoŝuk 1969, 56; Sedov 1982, 128; Vojnarovs′kij 1992, 41–42), Croats – E. Timofieiev, V. Petehyrych, O. Motsia (Timofeev 1961, 69; Petegirič 1990, 73; Mocâ 1994, 31), Croats-Tivertsi – I. Voznyi (Voznij 2009, 365), late Croats-Halychans – B. Tomenchuk (Tomenčuk 2006, 110); 3. Pagan – V. Petehyrych and O. Motsia (Petegirič 1990, 73; Mocâ 1994, 31); 4. Evolution-functional – B. Tomenchuk (Tomenčuk 2006, 110); 5. Christianization – S. Pyvovarov, S. Mayarchak (Pivovarov 2006, 169–171; Maârčak 2018, 278–280).

As for the chronology, their distribution most likely took places at the end of the 11th – beginning of the 12th century and spread widely during the 12–13th centuries. Obviously, it coincides with the time of the active introduction of Christianity. It has not yet been established which directions had a decisive influence on its formation, but it is worth noting the presence of similar types of burial sites in Germany, Czech Republic, Slovakia, Bulgaria, Romania, Macedonia and Poland (Hanuliak 1979; Pivovarov 2006, 168; Marek 2013, 36; Kalaga 2014; Lucik 2020a, 105–107; 2020b, 495–534).

Brief conclusions

Returning to the Kopachyntsi burial ground and its chronology, we face a problem, because both the discovered grave goods and the time of distribution of under the slab burials can be dated quite widely. On the other hand, the analysis of ceramic material shows that the main phase of the hillfort (in examined area) was towards the end of the 11th – first half of the 12th century. In consideration of the fact that stratigraphy during the research could not be recorded, and there is no information about presence of ceramics in the infill of the burial pit in the field documentation, the evidence seems to agree with such a broad chronology of the 11th–12th centuries.

However, we can assume that the burial complex was established there probably in the middle of the 12th century. Considering the fact that some of the burials were cut by later ones, the cemetery functioned even later and, based on the research carried out by Tomen-

chuk, perhaps even until the 13th century (Tomenčuk 1988, 21–22; 2006, 95; 2008, fig. 308, 308.1, 308.2). Undoubtedly, such conclusions are only preliminary and, in general, represent an introduction to the research problem, and therefore require new studies. At the same time, this detailed examination of an archaeological source base that was already accumulated in the past, consisting of the revision of mainly unpublished research materials and their introduction into scientific circulation, creates a precedent for future research and discoveries.

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Pilgrimage Crosses from Explorations of the Parish Church in Końskowola (Lubelskie province)

Abstract

Dobek M., Michalik J., 2021. Pilgrimage Crosses from Explorations of the Parish Church in Końskowola (Lubelskie province). *Analecta Archaeologica Ressoviensia* 16, 147–156

Archaeological explorations carried out inside the crypts of Catholic churches typically deliver a wealth of movable historical artefacts, including numerous devotional objects such as pilgrim souvenirs. During excavation works in the crypts of Końskowola parish church of The Discovery of The Holy Cross and St. Andrew the Apostle, two wooden crosses made of dark wood were found. Looking at the history of devotionalism and the pilgrimage movement, it became possible to define the role of the described objects when they reached Końskowola. Type analysis of the material used in the production of the objects can help in further studies on wooden objects brought to Poland over the centuries.

Keywords: pilgrimage crosses, wood, modern period, church, Końskowola, Poland

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Introduction

Through the ages, the rituals and features of the religious life of Christian societies have changed substantially. The way of perceiving and demonstrating faith and its impact on human everyday life, despite people's social position, has also transformed. However, there are some aspects of spiritual life which have not changed or evolved, nor have they been forgotten, and this includes undertaking pilgrimages to holy places – sanctified by God Himself, or by presence of graves and relics of persons commonly believed to be saints. The very idea of the pilgrimage is much older than Christianity, because the Old Testament Book of Deuteronomy recommends visiting the Jerusalem Temple – the place inhabited by God – three times a year (*Biblia Tysiąclecia* 2002). With time, after the destruction of the temple, Jews chose other locations, known from their biblical descriptions as obligatory pilgrimage destinations.

In the first centuries of Christianity, the Holy Land was the center of pilgrimage life, sharing its importance with time with growing role of other locations holding relics connected with Jesus Christ and being simultaneously the seats of historical Church authorities – Constantinople and Rome. As a consequence of the collapse of the crusader kingdom around Jerusalem – with the city being occupied by Muslims – the role of places connected with the activities of the Apostles increased, and this was not always focused on large urban centers. Santiago de Compostela, for example, is regarded as the most significant and simultaneously as one of the oldest centers of that kind (Mróz and Mróz 2013, 31) and it this site which popularized some of the first objects we know as symbols and souvenirs of Christian pilgrimages.

Recollection of the journey – pilgrim souvenirs

As it was in the past, contemporary centers of spiritual life also act as a focal point for many traders keen to sell all kinds of souvenirs to pilgrims, which after their necessary consecration become bearers of God's grace. The first pilgrim souvenirs also served as evidence of the effort taken by a pilgrimage to reach a holy place. Many pilgrimage locations offered, for example, special pilgrim plaques (Paner 2013, 18–20; Niedźwiadek *et al*. 2015, 113; Michalik 2016, 36).

The objects took various forms, with believers visiting the grave of St. James in Santiago de Compostela collecting characteristic shells associated with the saint, namely scallops. Evidence of this has not only been preserved in traditions and written sources, but also in archaeological finds. In the area of present day Poland, archaeological excavations have brought at least 10 preserved scallop shells (the number is not precise, because these finds were not reported in publications in many cases), found, among others in: Ostrów Lednicki, Kalisz, Kołobrzeg or Łowicz (Wyrwa 2015, 39–54) and Gdańsk (Paner 2013, 68). As early as the 12th century, these objects became so desired that their production in metal began – a more resistant counterpart to the organic originals (Paner 2013, 31). Increasing demands for evidence of such visits led to the production of symbolic emblems in the form of pilgrim plaques. The first of these, reminiscent in their forms of church seals, were created in centers situated along *Camino de Santiago*, in: Rocamadour, Le Puy-en-Velay, Amiens, Saint-Gilles-du-Gard, Saint-Leonard-de Noblat, Cologne, Maastricht and Aix-la-Chapelle, Canterbury and Rome (Paner 2013, 36–37; Wojciechowska 2019, 139).

Attempting to characterize a pilgrim plaque, we can define it as lead-tin cast usually made in a stone mold. The earliest plaques were massive, with a one-sided relief and with s total size not exceeding 4–5 cm. From about 14th century onwards, openwork examples gained popularity, replacing the old plaque forms. During a pilgrimage they were fixed to clothes, bags or hats and they were identifications of pilgrim status and, after returning home, they were used as devotional objects (Trzeciecki 2000, 116; Rębkowski 2004, 156; Michalik 2016, 36; Paner 2016, 69). The abundance and variety of pilgrim symbols, as well as the number of places in which they have been found from the late Middle Ages to modern times is evidenced by the rich collection of the Archaeological Museum in Gdańsk, which includes 704 artefacts of that type. They are not only plaques, but also small bells, whistles, and tiny reliquaries. Most of the pilgrim plaque collection and other devotional objects has been digitized and is accessible online (https://www.archeoportal.pl/zabytki?nazwa=plakietka+pielgrzymia, access: 22.09.2021).

The relatively poor collection of crosses and medals might seem surprising, but these types of devotional objects gained popularity relatively late. The manufacture of holy medals increased in modern times, when the medals of St. Benedict became particularly popular. This is also the period when the occurrence of pilgrim plaques in Polish contexts largely disappears.

The changes in the forms of devotional objects in modern times can be perfectly illustrated by materials from archaeological explorations. During excavation works within the area of the Old Town in Wrocław, 37 pilgrim plaques were found – the oldest item dating from the second half of the 12th century, and the most recent to the beginning of the 15th century. Based on the images presented on the plaques, we can observe changes in pilgrimage routes: until the mid-point of the 13th century, souvenirs from Santiago de Compostela are the most frequently found, but next two centuries show the dominance of finds manufactured between the Meuse and Rhine Rivers – generally plaques from Maastricht and Aix-la-Chapelle (Sawicki and Wachowski 2018, 729). Together with the waning popularity of wearing pilgrim symbols, we can observe far fewer devotional objects in the archaeological material, in particular among finds coming from cemeteries. This fact can primarily be associated with the character of their historical production, which was concentrated mainly on crosses and medals manufacturing (until the 17th century they had not been in mass production). How can we explain this situation? In former centuries, crosses generally functioned in two forms – worn as an individual encolpion (medallion-reliquary), and the crosses worn by clergy. Holy medals in turn were initially perceived as a form associated with pagan amulets, and generally frowned upon by the Church authorities. The Counter-Reformation is regarded as being the impulse for the fashion of possessing devotional objects. Since the times of Martin Luther, objects of private worship were no longer so closely related to the place, which was largely due to the restriction of pilgrimage in the areas so far abundant in religious centers, which in the 16th century fell within the sphere of Protestant influence. For example, the production of the Canterbury pilgrim signs ended with the destruction of the shrine

of St Thomas Becket in 1538, and the fate of this English center was also shared by the sanctuaries in Wilsnack, Gustrow and Saint-Josse-sur-Mer (Paner 2013, 54, 83, 148, 194). The extent to which the Reformers fought against the cult of saints and the pilgrimage movement can be most clearly demonstrated by the fact that a significant number of pilgrim's plaques discovered during archaeological works are found in latrines – the Reformation led to the so-called "War against the idols", which manifested itself, inter alia, in the destruction of devotional items (Paner 2013, 533). The Church responded to the criticism of aspects of the faith by Protestants – such as the cult of the saints and the Virgin Mary – by reproducing images of Mary and saints on medals as an indirect effect of this criticism (Chudzińska 2008, 346). Wearing scapulars related to the Marian cult also become popular (Nowak and Przymorska-Sztuczka 2013, 54–58).

Archaeological explorations of the parish church in Końskowola

The parish church which is the object of our research was thoroughly renovated between 2010–2011. One of its parts was examined archaeologically by the team supervised by Dr Rafał Niedźwiadek from the firm Archee. As a result of that work, three crypts were excavated and the church history was verified – three stages of its construction were reported, the original floor was revealed and the remains of Zofia Opaliński, the Duchess of Lubomirska, were exhumed (Niedźwiadek and Tkaczyk 2011).

The beginnings of mediaeval settlement in the area date back to the 12th century, but as late as 1532, at the initiative of Andrzej Tęczyński, Końskowola (Fig. 1) gained its location charter based on Magdeburg privileges from King Sigismund the Old. The church of the Discovery of the Holy Cross and St. Andrew the Apostle belongs to the most important city objects and its beginnings date back to the end of the 14th century, when the first wooden construction was probably erected on the site. The present structure was founded in the middle of the 16th century by Andrzej Tęczyński, the Lublin voivode and castellan of Krakow. Contributing to the town's dynamic development, Tęczyński also played a very significant political role – during the interregnum period, when Henry III of France abandoned Poland, he was one of the candidates for the crown from the noble camp. Other eminent personalities connected with Końskowola in the following centuries are: Łukasz and Izabela Opaliński, Zofia Opaliński, Duchess of Lubomirska,

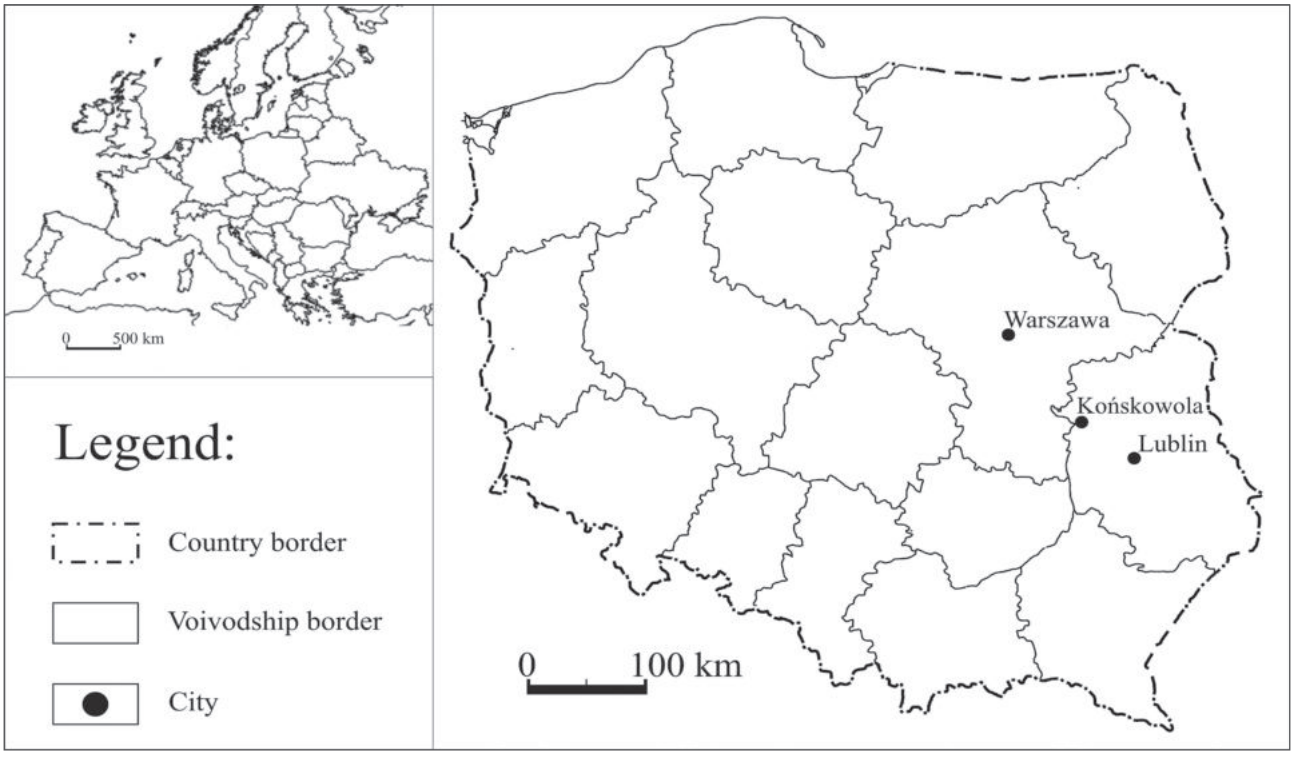

Fig. 1. Map of Poland with the location of Końskowola marked (edited by J. Michalik).

Elżbieta Sieniawska (daughter of Duchess Zofia and Stanisław Herakliusz Lubomirski) and August Aleksander Czartoryski, the voivode of Rus and the creator of "The Family" power (Pytlak 2006).

Pilgrim symbols from Końskowola

As it was in the Middle Ages, in the modern period and today, there are many varied forms of pilgrimage signs and symbols, and therefore devotional objects are not limited to homogeneous standard patterns, although characteristic types of holy medals appear as well. During archaeological exploration, the Końskowola church furnished thirteen holy medals and crosses, representing a spectrum of devotional objects from the 17th until the 20th century (Nowosad *et al*. 2021, 97–103).

Three of the finds are medals which are evidence of series of western production reaching Polish lands – these are a St. Benedict medal and two Miraculous Medals (Nowosad *et al*. 2021, 98, 101). Devotional objects related to the cult of St. Benedict are regarded as prototypes of modern holy medals – they were popularized in the beginning of the 17th century and are one of the first to be approved by the clergy, who defined their role not as a common amulet with magical properties, but as a sacramental material object (Hiżycki 2011; Szczaniecki 2016; Michalik 2017, 16–17; 2020, 167–187; Guéranger 2018). The Miracle Medals, in turn, are related directly with the Mother of God – its pattern is believed to have been passed to Catherine Laboure in 1830 by the Blessed Virgin Mary herself during a revelation, and Mary is believed to have requested: *Take care the medal is cast according to this pattern; all people wearing it on their necks will be blessed with graces. Especially those who trust in me.* This event led to the popularization of such medals on an unprecedented scale, which in turn led to its recognition by the Holy See in 1838 (Zachwieja 2005, 131; Pałubska 2008, 379).

The collection also contains less popular medals: an artefact with an image of St. Anne and Joachim, and evidence of Polish production – an image of God's Mother of Częstochowa. Crosses found in the Końskowola crypts also represent various styles. The first is an *Arma Christi* presenting the Instruments of the Passion (Nowosad *et al*. 2021, 98, 102). That motif was often depicted not only on devotional objects but also on wayside crosses. Images combining the crucified Christ and the Blessed Virgin Mary were also commonly manufactured and they were worn by members of the brotherhood of the Blessed Virgin Mary Immaculately Conceived (Białobłocki 1991/1992, 166). Analyzing the other cross examples excavated in Końskowola, we concluded that the objects had been manufactured both by casting and in home workshops as well – e.g. the plain cross made of bone plates without Christ's image (Nowosad *et al*. 2021, 98, 100).

The last cross type excavated in the site included two wooden crosses produced in the South of Europe, evidently souvenirs of pilgrimages. These two crosses were analyzed in more detail.

Cross – a souvenir from Lourdes

The cross from Lourdes (Fig. 2), originally belonged to a rosary – a pilgrimage souvenir from the Marian sanctuary. Using wood with silver-plated fittings is characteristic for objects manufactured since the 18th century (Romanowska 2007).

The crucifix consists of three parts: wooden plates, metal fittings and a metal Christ figure. Originally there were five elements with fittings made of silver-plated metal: four tins were placed on both beams' ends, and the tin with inscription was situated at the bottom of the cross. The fittings were also equipped with a kind of blade, being the final 30 mm of the cross beam's length. The fittings' measurements were: 45 mm long, 12 mm wide, and 8 mm thick. The tin of the metal elements was 1 mm thick.

Two fittings which were originally placed on the ends of the vertical beam are unfortunately missing. Based on similar examples (Niedźwiadek *et al*. 2015, 74, 77), we can conclude that the bottom fitting would have had the same size and construction as the preserved ones, with an exception being the top fitting which may have had a hook or other element for joining the cross and the rosary together.

The metal plate located at the cross bottom was made of one metal piece. Where the arms cross, there is a diagonal inscription 'Lourdes', 16 mm from both edges of the horizontal beam (the inscription length – 25 mm). It indicates the place of origin of the studied object. The tin has four rivets, three of which fasten Christ's figure (rivets with flat heads, diameter – 2.5 mm, placed on the cross arm 8 mm from its edge and in the middle of its width, on the vertical beam the rivet is situated 24 mm from the bottom cross edge). The fourth rivet, tube-shaped with a flat head and a diameter of 2 mm, fastens the titulus and is situated 14 mm from the cross top. The silver-plated Christ's figure is placed 25 mm from the top and 18 mm from the cross base, is 37 mm long. Jesus' arm span is 30

Fig. 2. Cross from Lourdes (photo by J. Michalik).

mm, and the arms are lifted slightly over the head in the middle of horizontal beam width. The image is relatively detailed, without keeping the symmetry of the figure. The titulus, placed 9 mm above Jesus' head, is fastened in an unusual vertical direction and the inscription 'INRI' is almost at a 90-degree angle. It was made intentionally because of the titulus length – if placed horizontally, it would be 2 mm wider than the cross. The plate is 12 mm long and 6 mm wide.

The 'ITALY' Cross

The other wooden cross with metal fittings was produced in Italy, probably in the 1930s (Fig. 3). This was probably a pilgrimage souvenir and its size indicated that it could have been a wall crucifix (it cannot be excluded that it was a personal object either). The cross is deprived of its three essential original elements: the image of the crucified Christ, a titulus placed over the figure, and a metal ring for hanging the object on a string or a wall. The fitting has the form of a metal element of the cross shape being the cover of the back part and the arm edges which support wooden beams, and it is made of nickel-plated iron. Rivets originally fastening the figure and the titulus missing at present are placed at the beams ends. Small corrosion loss is visible at the beams' crossing point, and the right cross arm. The external fitting of that beam's edge is also partly damaged. On the cross surface, at the fixing place on the left arm, a hole left by a fifth rivet is visible – probably a sign of an error while the object was being produced. The bottom part of the tin bears the inscription 'ITALY', which would be the location of the object's manufacture.

The cross consists of two beams which are 9 mm wide and 7 mm thick. The vertical beam is 90 mm long and the horizontal one – 53 mm long. The beams cross 20 mm from the object's top and 62 mm from its bottom and they are joined together without any rivets, only with a flat mitre connection. The arm fittings have an identical size and make up the final 5 mm of the beams' length, with one exception – cross

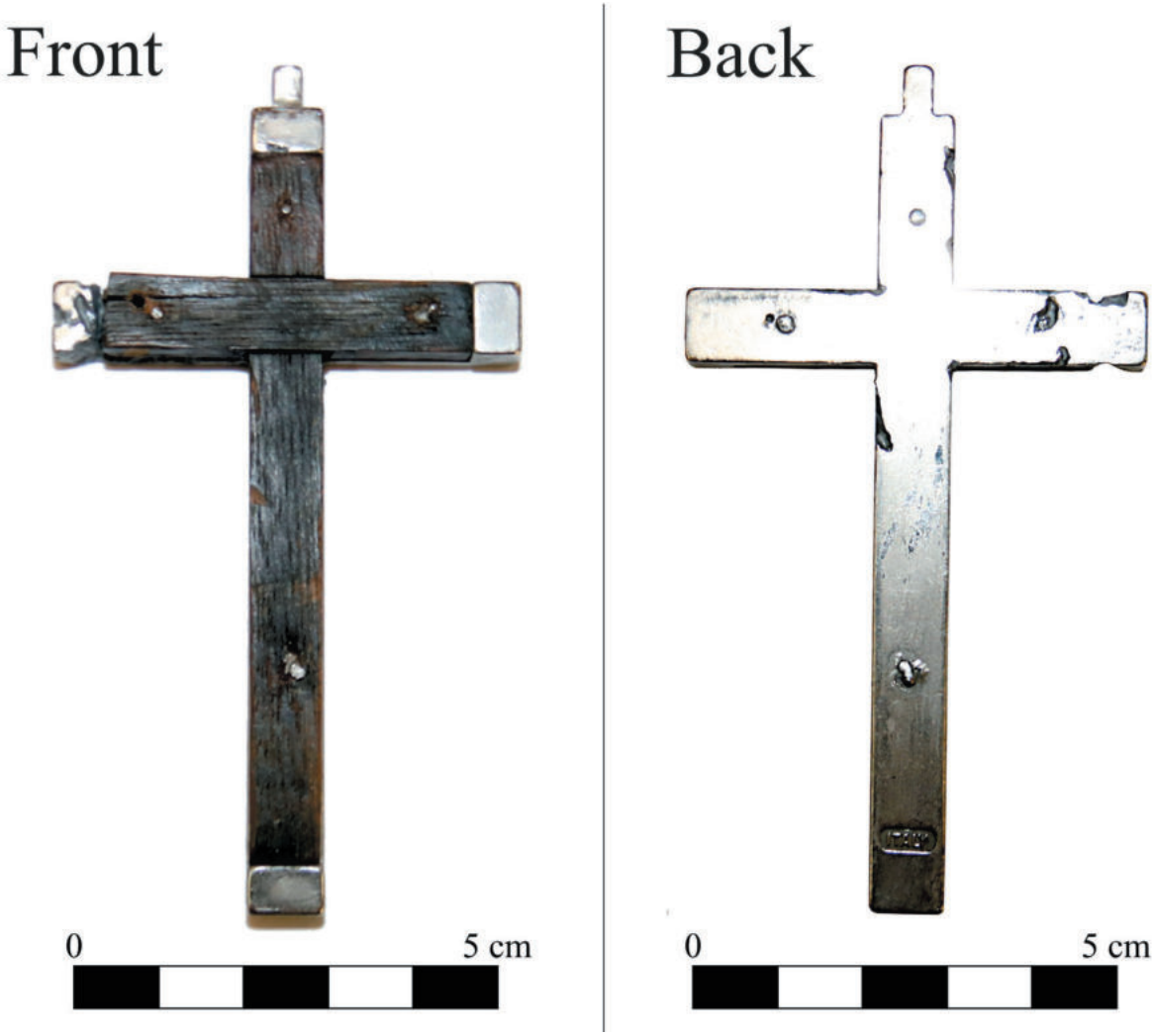

Fig. 3. Cross 'ITALY' (photo by J. Michalik).

top fitting with a rectangular loop for hanging the object – 6 mm high, 4 mm wide and 5 mm thick. The wooden lining is 4 mm thick and the beams are – 42 mm – horizontal one, and 89 – the vertical one. The inscription in bottom tin part is placed 7 mm from the cross edge, and has a size of 7 × 2 mm.

* * *

Estimating the chronology of both the discussed objects is a problematic issue. Their dating is impossible, because they were found on the floor of the northern crypt, among the relics of coffins from the 18th century, but also alongside historical objects from the 19th and 20th century. The lack of an unequivocal archaeological context makes it impossible to say to whom these items may have belonged and whether there are any source premises confirming the participation of this person in pilgrimages. However, assuming that these devotional items were not placed in the basement as rubbish, the very fact that the owners of the crosses were deposited in the crypts of the church indicates that they may have been people of significant social status. At present, dating them solely on their forms and manufacturing technique is impossible, because similar objects have been in use since the middle of the 19th century until the present. Some suggestions concerning the age of the discussed items can be obtained comparing similar items accessible in foreign Internet antique shops. The information attached to them defines the chronology of cross production from the end of the 19th century until World War II, although these dates cannot be regarded as reliable. The problem not only concerns the items discussed here, but all devotional objects produced in the 20th century. The intensity of the pilgrimage movement and the

mass production of symbols and objects makes patterns and historical forms repeat and imitate, which is an obstacle to dating them solely on the basis of their features (https://myvimu.com/exhibit/54787082-rozaniec-koraliki-z-drewna-italy; https://myvimu.com/exhibit/54783694-rozaniec-koraliki-z-drewna-italy; access: 22.09.2021).

Timber species identification from the wood cladding of the crosses

Wood species identification of the crosses cladding was difficult, because the dry wood was very hard and taking samples for conventional transmitted light microscope examination was impossible. Therefore, wood structure was tested using reflected light microscopy, directly on the objects' layers.

In the case of the first cross with the 'Lourdes' inscription, the structure of xylem in cross section turned out to be the most readable (Fig. 4: a), and it enabled us to compare the item with examples of xylem belonging to Ceylon ebony (Fig. 4: b) (Jahanbanifard *et al.* 2020, 582–588). It helped us to identify the wood used as a kind of ebony.

The definition of ebony wood (*Dospyros L.*), refers to over 800 species of trees and shrubs (Linan *et al.* 2019, 360; Jahanbanifard *et al.* 2020, 577). The characteristic dark ebony color appears together with tree growth and it becomes hard and resistant to decay. Thanks to these properties, it is a perfect material for turning and polishing, used for luxurious furniture production and various items of everyday life, including devotional objects (Podbielkowski and Sudnik-Wójcikowska 2003, 149; Włodarczyk 2011, 97). Ceylon ebony (*Diospyros ebenum König*) has been the most popular imported wood in Europe (Podbielkowski and Sudnik-Wójcikowska 2003, 149). These trees grow naturally in India, Sri Lanka, tropical regions of Africa and Oceania (Podbielkowski and Sudnik-Wójcikowska 2003, 149). It was typically transported to Europe by sea via Arabic ports (Włodarczyk 2011, 98), and this was probably the way in which the ebony used in the cross manufacture also arrived.

The wood species identification of the other cross marked 'ITALY' was not obvious either. Reflected light microscopy was also used and the object's transverse cross section was the most readable (Fig. 5: a), revealing the structure characteristic for diffuse-porous deciduous trees. Comparative analyzes between the observed wood sections and the tissue stencils from wood anatomy catalogs (Greguss 1959; Schoch *et al.* 2004; Schweingruber 2013) indicate the use of birch (*Betula sp.*) wood (Fig. 5: b).

It is not known why the natural wood color was not kept – it was stained dark, perhaps to imitate ebony. However, it is possible the wood was painted to increase the artistic value of the cross. The presence of birch is also surprising, since the tree is not very

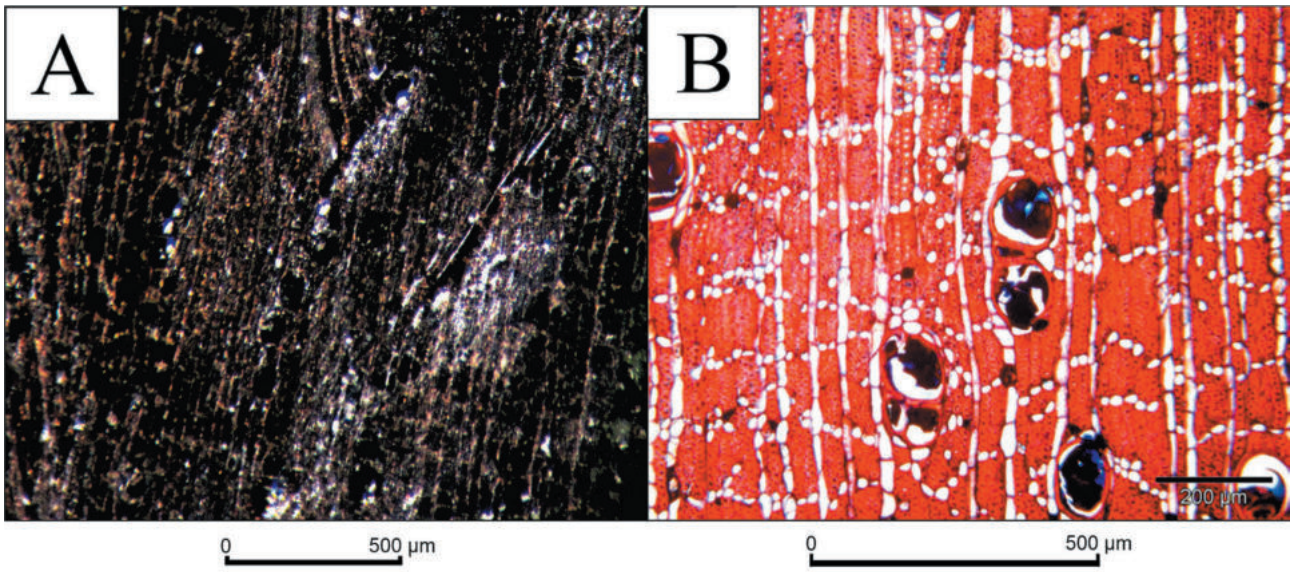

Fig. 4. Structure of wood xylem in cross-section: a – cross 'Lourdes' from Końskowola (photo by J. Michalik); b – example of Ceylon ebony (*Diospyros ebenum König*) (after Jahanbanifard *et al.* 2020, fig. 1D).

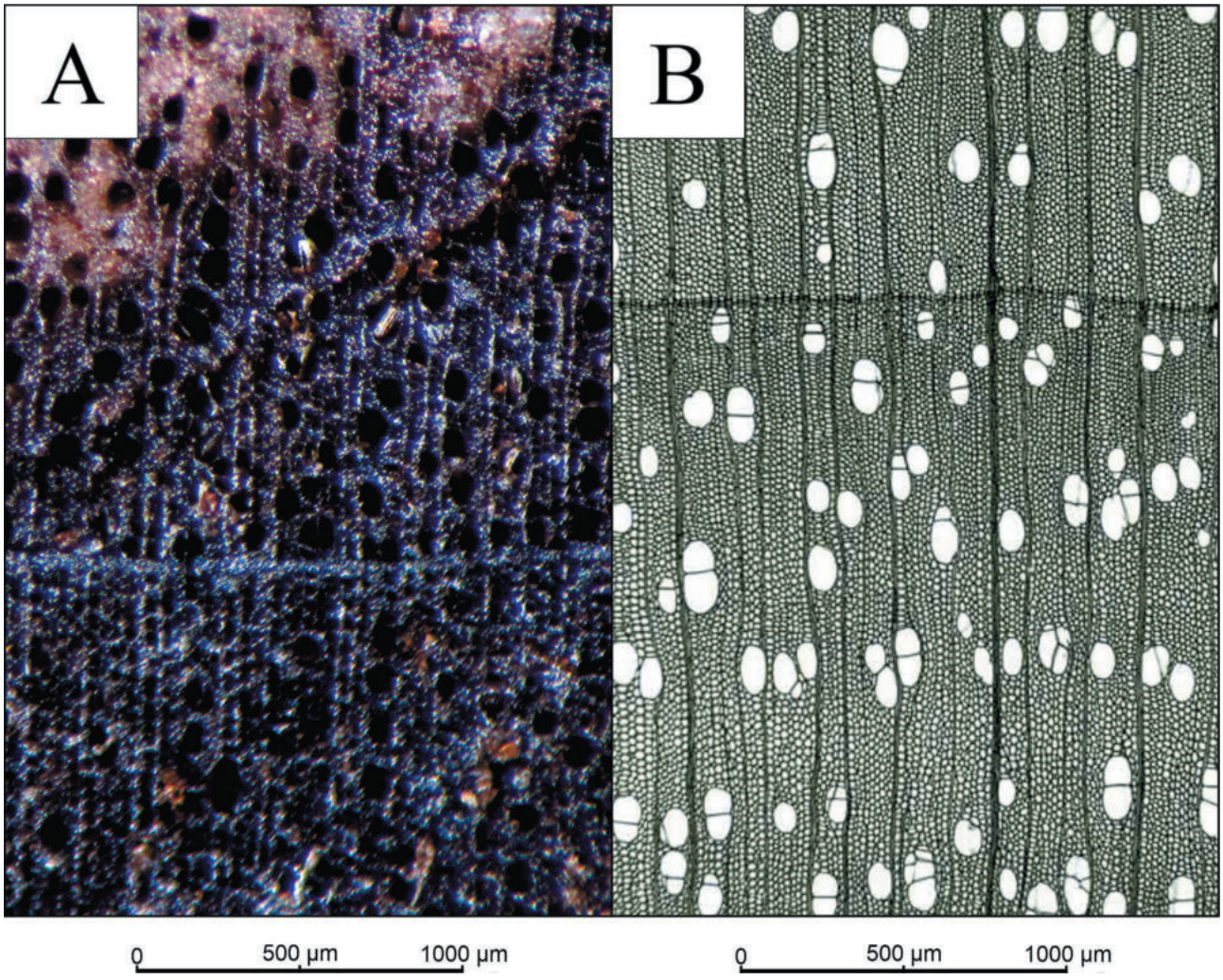

Fig. 5. a – wood cross-section from cross 'ITALY' (photo by J. Michalik); b – sample of cross-section of birch xylem (after Schoch *et al.* 2004).

common in Italy (Seneta and Dolatowski 2012, 125). The cross may have been manufactured in Central Europe and finished with metal fittings brought from the South. It is also possible that the cross initially had a cladding made of a different type of wood. After the cross had been transported to Poland and used there for a long time, its cladding was damaged and a replacement was made from local wood. This question remains unsolved.

Summary

Modern devotional objects are mass, popular and rather well known artefacts, with satisfactorily elaborated material, but it does not mean that everything is clear and obvious (Chudzińska 2008, 346). The examples discussed above are testament to the fact that these objects differ and, despite their popular form, the analyzes show that they have unique features for the Polish context. A fragment of a rosary from Lourdes, because of its material (ebony), which is rarely used in Polish contexts, can be comparative material for the further identification analyses of archaeological wood. Surprising results of sample tests of the cross 'ITALY' in turn, show attempts at imitating ebony, which can be helpful in studies on the production and market for devotional objects. Using birch wood in Italy seems to be rather suspicious. We can assume, of course, that the pilgrim was aware of the object that they had bought, or perhaps the traders did not respect either professional ethics or Christian spirituality. Imitating precious ebony by using stained birch could have been an intentional ploy to cheat an unawary customer.

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REVIEWS

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(review) S. Kadrow and J. Müller (eds.). *Habitus? The Social Dimension of Technology and Transformation* (= *Scales and Transformation* 3). Leiden 2019: Sidestone Press, 230 pages, 15 figures (bw), 65 figures (fc).

Let us assume at the outset that in the process of making conclusions concerning research on prehistory, the cognizing subject is "contaminated" by their own reality (Pawleta 2016, 13–14), and we are dealing with objectivist thinking (i.e. a closed, unchanging system; e.g. Hetmański 2015). Therefore, achieving an interpretative optimum, one devoid of superficial explanations, requires the adoption of a specific theoretical perspective: *the assessment of any work on the distant past should take into account not so much the truthfulness of pronounced judgments, which are unverifiable due to the absence of the past, but the coherence and logicality of interpretation and argumentation, as well as the strength of its persuasion and contention* (Pawleta 2009, 457). Hence, when trying to refer to phenomena in prehistoric times, in fact – through the remnants of the available materials – only fragmentarily available, one should take into account not the authenticity of the cited narrative, unverifiable due to the lack of the presence of the cognizer in prehistoric ages, but the transparency and logic of the argument as well as the power of an intentional, even quasi-performative influence on the scientific community (in the sense expressed not only in speech, but also in writing, in the creation of a bygone reality, using appropriate imagery; on performative statements: cf. Austin 1993; Brożek and Kasprzyk 2007).

In the monograph edited by Sławomir Kadrow and Johannes Müller, entitled *Habitus? The Social Dimension of Technology and Transformation*, published by Sidestone Press as part of the Collaborative Research Center series (CRC 1266, *Scales of Transformation in Prehistoric and Archaic Societies*), texts on social changes in the aspect of technology are presented by various authors representing different research centres – from Scandinavia to the Balkans, from the British Isles and France to Ukraine and the North Caucasus. The content of the chapters is not limited in time and territory to a specific prehistoric period or archaeological culture. On the contrary, by showing a broad perspective, including a fragmentary ethnological perspective, the publication deals with a very important issue of the social interpretation of various views and shades of technological behaviour, including, importantly, that which is innovative in nature. The link between the individual parts of the work which might not necessarily seem thematically coherent is the title *Habitus* and what emerges from behind this concept.

The Habitus concept, developed since the 1970s by Pierre Bourdieu (e.g. 1977), is characterized by the editors of the volume as follows: 1) [Habitus – ed. DW] *is a system of permanent dispositions, functioning as structuring structures*; 2) [Habitus can be understood as – ed. DW] *principles generating and organizing practices and ideas*; 3) *Habitus is the internalization of external structures (norms, moral orders) and generates strategies that allow a person to deal with different situations in a consistent and systematic way. Habitus leaves some space for improvisation* [...] (Kadrow and Müller 2019, 11).

The author of the introductory theoretical chapter on Habitus, Vesa Arponen, highlights the intentions of Bourdieu in relation to the approach to the interpretation of social life in general, holistically taking its particular components as a whole: *With Bourdieu we are to think of social life as a vast set of processes that are continually unfolding in time and space, which*

he calls the 'field'. Interlocking in the temporal and spatial unfolding of the fields of practice are agential deliberation as well as dispositions and practical (embodied) know-how together with the societal structures, all fitting each other, as if puzzle pieces, to generate, regenerate and reproduce social life and daily basis (Arponen 2019, 15). Moreover, an attempt to outline a somewhat idealistic vision of a synthetic idea of social relations in ancient times is irresistibly associated with the need to reconcile with each other concepts that seem to be contradictory: *subjectivism and objectivism, internal agency and external structure, dynamism and change as well as durability and structured reproduction, practical and embodied as well as reflective and deliberative reason* (Arponen 2019, 15). The holistic approach proposes to conceptualize the integral framework for understanding human action as arising, on the one hand, from human agency and, on the other, from social structures external to the acting subject. Action is to take place in a context in which subjectivity and structure come together to nourish social life (Arponen 2019, 15; cf. Giddens 1979; 1984).

The author of one of the subsequent texts in the reviewed volume, Bisserka Gaydarska, defines a similar system of interactions: [...] *the habitus – is not characterized by causation but it is rather a dynamic set of principals that are shaped by people and are simultaneously shaping people* (Gaydarska 2019, 49), as well as P. Bourdieu himself: [...] *habitus is a relationship of ontological complicity of the world* (Gaydarska 2019, 49 after Bourdieu 1985, 14).

Let the thought of Willard O. Quine, whose influence on the contemporary perception of the philosophy of science is overwhelming, serve as a classic model for this type of comprehensive approach to the problem of empirical reaching the cognitive optimum: [In accordance with the dogma of reductionism – ed. DW] […] *each sentence, considered in isolation from the rest of the sentences, can be confirmed or debated. The opposite position* [...] *is that our claims about the outside world are brought before the tribunal of sense experience not individually but collectively* (Quine 2000, 70).

Like any theory that appears in the humanities and social sciences, that of Bourdieu's inevitably enters into a relationship, and often also into controversy, with other concepts – both on the theoretical level and when a given issue moves from the sphere of dry theoretical scrutiny. to the area of practice. The limitation of applicability seems to be the risk of excessive generalizations and simplifications, as well as the fact that Habitus and other terms related to it ("field", "social capital", "social violence", "maintaining": Kadrow and Müller 2019, 11) as strongly embedded extrapractically and naturally functioning theoretically-descriptively, may show poor empirical translatability: *the synthesis is so comprehensive that it rather describes a set of problems than provides a solution for dealing with them* (Arponen 2019, 16).

This review is also intended to persuade the reader to different perceptions, which I will try to explain in an appropriate way, referring to the selected texts contained in the volume. The point is not to quote the content of each of the dozen or so articles here in abbreviated form (because the editors have already done so in the introduction: Kadrow and Müller 2019, 11–14). It is rather my intention to familiarize the reader with examples of the application of the Habitus concept on archaeological grounds – discussing specific attempts of such applications presented by the authors.

An interesting attempt to deal with the concept of Habitus as a potential driving force of change is made by Gaydarska in relation to – as it is sometimes referred to – the protocivilization of Cucuteni-Tripillia (5200–2700 BC). The author points to the integrity of the socio-cultural system manifested in ceramics and figural art throughout the entire period of functioning of mega-sites, even with the expansion of their areas (sometimes up to 200 ha). The essence of Cucuteni-Tripillia, reflected in the relative uniformity of material culture for hundreds of years, was to be constituted, according to the quoted researcher, rather in elements of the so-called "Big Other" concept, characterized as follows: *The symbolic Big Other also can refer to (often fantasmatic/fictional) ideas of anonymous authoritative power and/or knowledge (whether that of God, Nature, History, Society, State, Party, Science* [...]) (Johnston 2013). According to the author of the chapter, elements of the Big Other can also be found in the material dimension of everyday life, and this concept goes far beyond the level of individuals themselves.

On the other hand, the concept of Habitus is largely part of the personal, community and intercommunal commitment of each individual to the surrounding world. The mutual interaction of these two spheres may explain the Cucuteni-Trypillia paradox – namely, changes could have occurred on the basis of Habitus, but the dominant symbolic order had to remain the domain of Big Other (Gaydarska 2019, 50). In the context of the sudden appearance and disappearance of mega-settlements, as shown by the frequency analysis of figural art and spatial distribution of sites, the stimulus of social transformation was neither technological innovation nor environmen-

tal changes, but rather changes within the Big Other (Gaydarska 2019, 66).

Interestingly, the less theorizing and archaeologically more traditional approach to the problem of socio-cultural change in Cucuteni-Tripillia gave rise to a different kind of conclusions by Aleksander Diachenko, where Habitus could play a fundamental role. According to this author, along with the demographic growth and territorial expansion, there was also the development of technological and economic innovations, most of which were introduced as a result of the external influences of neighbouring communities. The researcher also points to the migration pressure from the outside, which was to contribute to the formation of mega-settlements, as well as to climate change as other factors determining the changes in the population structure (Diachenko 2019, 80).

In another interesting chapter of the book, Sabine Reinhold reflects on the possible connection of some technological innovations (metallurgy, military, wheeled transport) with the manifestations of Habitus listed by herself: a) as the elite of warriors in the Black Sea, the Eneolithic Maykop culture, b) as the steppe Habitus in the Yamna culture (Reinhold 2019, 104–105).

On the other hand, the article by Valentin Pankowski deals with the problem of the relationship of centres and peripheries in the Bronze Age of Eastern Europe in terms of innovation and technology (mainly metallurgical), which is to be the main driving force of social change. According to the author, the outlined concepts of genesis and cultural and social transformation focused on technological progress receive additional support thanks to the Habitus concept in assessing their integrity and cohesion (Pankowski 2019, 224–225).

Noteworthy is the only chapter in the monograph in the field of ethnoarchaeology, the author of which is Christian Jeunesse. Although Habitus is not mentioned by name even once, its shadows can be found in the text on archaeological grounds (Hallstatt/early La Tène) and in reference to a selected ethnographic parallel (among others, in the observation of the communities inhabiting the Indonesian island of Sumba). In both cases, the researcher describes the socio-political system as dual, without clearly referring to the mechanisms of cultural change, but rather looking for internal differences among the populations/archaeological units selected for research. Jeunesse believes that when trying to understand the principles of social organization in prehistory, one should be very careful about the cultural ranges distinguished on the basis of the features of artifacts. Forms of social behaviour may have much broader frames, and social situations may paradoxically occur without any reflection in the material sphere. This is well reflected in the field research among communities in Southeast Asia. The fact that the participants of social life use exactly the same or similar products in formal terms, or live in houses that are similar in terms of architecture, does not completely reflect the truly diversified population structure and complex socio-political relations (Jeunesse 2019, 191–210).

To sum up, the considerations in all the texts of the monograph reviewed here concern the complex relationship between technology and social changes in different places and times, which is an evident unifying element in this publication. At the same time, it is worth noting that not all authors refer to the term Habitus *expressis verbis*, and some do so only casually. As a result, the reader has to decide for himself whether the concept is applicable in a given case and to what extent. When reading a few of the works, one gets the impression that Habitus is only an addition to previously prepared texts rather than a driving force behind the published content. Thus, some chapters, which remain – which should be emphasized – at a very high scientific level in their subject areas, lack direct references to the theory and do not seem to be directly inspired by the thought of Bourdieu. Despite such an impression, on the other hand, it can be concluded that all components of the monograph can be conceptually located – at least by assumption – on the theoretical axis of Habitus, sometimes only being poorly visible explicitly.

The reviewed book does not provide for an ending, although an extensive editorial introduction compensates for the lack of conclusive content. The multi-author work *Habitus? The Social Dimension of Technology and Transformation* is certainly one of the few works in the field of archaeology in the scale of all produced, in which – with the very individual research focus of individual authors – an attempt to look at the diverse and different-time source materials in a certain way has been successful. Undoubtedly, the effect of the work's coherence was achieved thanks to the special attention of the editors of the volume. I consider this work as important reading for those interested in archaeological research at the macro level, in the context of technology and society. Assuming, from the theoretical point of view, a creative construction of the reality that has passed by contemporary pre-historians rather than its reconstruction, I would encourage the reader to pay attention not only to the texts that fit the Habitus concept

in the reviewed publication, but also to the chapters prepared as interpretative counterproposals to Bourdieu's thought.

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(review) J. Kopacz (ed.). *The end of the Stone Age on the Stránská skála Hill in Brno – lithic production or "optimalisation"?* (= *Collectio Archaeologica Ressoviensis* 41). Rzeszów 2019: Wydawnictwo Uniwersytetu Rzeszowskiego, 257 pages.

The experienced team of Jerzy Kopacz, Antonin Přichystal, and Lubomir Šebela have collaborated with Jaroslav Bartík, a younger progressive colleague, to produce a modern monographic evaluation of the Stránská skála hill occupation by Bell Beaker people. A wide spectrum of external experts was involved in specialised analyses. Stránská skála hill is one of the most famous south-Moravian archaeological sites, which joined the benefits of a raised location with a good overview of the Brno basin's surrounding landscape and a source of local cherts; although its homogeneity and knapping quality varied from very fine to very coarse. The site was occupied as early as the Cromer interglacial period; nevertheless, the focus of the presented book is a brief span of its occupation, at the turn of the Stone and Bronze Age, represented by the Bell Beaker archaeological culture at Site IV.

The text is divided into three main parts. *The Preliminaries* involves common introduction chapters related to the site, its geology and geomorphology, a description and sorting of the Stránská skála cherts, and an overview of the previous archaeological research. The second part of the book, entitled *Stránská skála 2016*, is dedicated to a detailed analysis of Site IV field situation, artefacts and samples. The last part presents concluding chapters.

The main research questions, formulated in the first chapter, are related to stone processing strategy, the preferred source of the chert, and the position of the site in the operational chain of the produced lithics. The traditional stone management of the local population of the Jevišovice culture (which preceded the Bell Beaker people) could be adopted when the local sources of the raw material were utilised, or the typical patterns of Bell Beaker knapping and retouching could be retained, although the raw material sources changed. The representative collection of 3,143 pieces of lithics found in the outcrop vicinity raise questions about their affiliation to an atelier, workshop or the settlement/functional zone character. The origin of the chert – from limestone outcrops, debris depositions on the hill slope, surface or even recollection of an older occupation layer – illustrates a certain plasticity in terms of production costs and strategies. The position of the site in some production and distribution networks was questionable because only four other sites are known in which lithic collections of the Stránská skála chert are present. All of them are quite close to the outcrop.

The second chapter elucidates in detail the complex geological situation of the site on the border of two geological units, the Bohemian Massif and the Western Carpathians. Stránská skála hill is formed by the largely preserved relic of the originally continuous sedimentary cover of the Jurassic limestone in the Brno basin. Three other relics exist in this region, although they are smaller or have even largely disappeared as a result of human activities. A layer of Devonian limestone forms the base of the hill, whereas a crinoidal layer and upper limestone layer create the upper part. Both limestone layers are rich in cherts. The upper limestones are preserved only on the Stránská skála hill, representing a unique source of well knappable banded cherts in the Moravia. Other relics only give cherts in the lower limestones. The third source of such cherts was formed by long-term geological processes, which eroded original Jurassic limestone cover and accumulated the nodules, blocks and gravel on river terraces. They were distinguished as Moravian Jurassic cherts. Intensive limestone quarry-

ing transformed the site's geomorphology, especially on the northern and western slopes.

The detailed description of the cherts continues in the third chapter, which is dedicated to the petrographic characteristics of individual variants. Although the author has published similar texts several times before, it has an indispensable place in the book dedicated to the eponymy site. The text completes the knowledge of this chert type in its geological and petrographic context, which is essential for an understanding of its accessibility, ability to be worked by knapping, and the preferences in the core exploitation strategies. The macroscopic features, microfossil description by water immersion method and thin-section microscopy in PPL and XPL is given. Tables of chemical composition using major oxides and rare earth element methods complete the chapter.

After a short chapter of the history of research on the site, including a helpful table ordering the individual archaeological activities and their references, a framing overview of the Stránská skála chert use in the prehistoric period is given. The Palaeolithic part is concise, whereas the primary attention is dedicated to Eneolithic and Early Bronze Age cultures. The sub-chapters of the Lengyel and Funnel Beaker cultures are mainly based on research by J. Bartík. The chapters provides the requisite information on technique, exploitation concept, produced debitage and its distribution pattern. Such information is perceptibly missing in the sub-chapters devoted to the Jevišovice and Únětice cultures, which are too brief and general, mentioning only sites and size of the collections, unfortunately.

The main chapter of the book (chapter VI) describes the excavation processes and results, including standard analysis of the findings – lithics, ceramics, bone tools and macroliths. The collection of lithics is particularly well analysed, including small items identified by floating. It is essential because a similar completeness of collections is certainly not the standard in Moravian research on the Bell Beaker culture. The preference of the coarse and hard variety of the Stránská skála chert coincides well with the Early Bronze Age strategies, when the most wear-resistant raw materials were preferred. Analysis of debitage butts, the low number of crested flakes or blades, and a wide variability in exploitation patterns showed the low application of sophisticated core preparation. It means the knapping was mostly opportunistic, although we do not need to agree with the author´s meaning of the low technological standard of the core. The ability to knap even difficult and coarse raw material needs skills and routine. The splinters formed 42% of the collection (if we count the items, not the weight), and the category of the production waste reaches 77%. Flakes dominate target production, representing less than 10% of the collection. The authors supposed the final purpose of such production were endscrapers, arrowheads, or so-called segments because finalised retouched tools are almost entirely absent in the collection. Unfortunately, the complete list of retouched tools is not presented in some of the tables but only mentioned in the text. For example, endscrapers are mentioned as the possible purpose of the flakes, but none is noted in the collection or referred to in drawings or photographs. All these features of the lithics collection are typical for workshop activities. All other findings are testament to everyday settlement activities, including the use and perhaps production of ceramics, the use of bone awls and needles, stone polishers, mills, and spindle whorls. Daub fragments have shown construction imprints.

The chapter devoted to expertise analyses (chapter VII) increases the amount of archaeological information considerably.

The use-wear analysis by Damian Wolski was applied to app. 2% of the collection due to the low percentage of non-waste items and lower legibility of the raw material under the microscope. It is mentioned several times that a certain part of the collection was thermally transformed and it is a pity that such information is not available in the tables in the previous chapter. Particularly surprising is the fact that use-wear was only positively identified on the surface of six artefacts, and it was weak and unspecific. Because other use-wear analyses of lithics knapped from Stránská skála chert were published (Šajnerová 2003a; 2003b; Kaňáková and Parma 2015), it cannot be caused only by poor legibility and preservation, i.e. it is potentially crucial for collection interpretation. An inspiring aspect is the fact that the author introduced the use-wear of technological features of the lithics, especially cores, to the analysis of Moravian collections. Such analysis is well known in Western Europe but it has not yet been applied in the Moravian context. The identified changes in chert colouration and other features of thermal alteration are interpreted as heat treatment aimed at improving the knapping quality of the rock. It should be reflected some older publications (McCutcheon and Kuehner 1997) dedicated to differences of heat treatment results in flint and chert, because physically it does not work well in case of heterogeneous structure of the chert material. Perhaps some small testing experiment on the Stránská skála chert might elucidate this question better.

Petrographic analysis of ceramics using thin-section microscopy by Anna Rauba-Bukowska presents

a precise and visually rich analytical chapter dedicated to ceramics. It significantly enriches existing knowledge of Bell Beaker ceramic petrography and technology in south Moravia. Despite some archaeological indications, the analysed samples of ceramics were not manufactured on the site.

Both the archaeobotany by Maria Lityńska-Zajac, and the archaeozoology by Miriam Nývltová Fišáková support the settlement character of the site. Although the samples were not numerous (in the case of charcoals of firewood) or well preserved (in the case of osteology), the results frame the site as a standard, small, non-specialised settlement.

In the third and concluding part of the book, the authors endeavour to insert the obtained local data into a broader European context of late industries and Bell Beaker diffusion. Although the introduction to the diffusion seems too long for such a purpose, and the mentioned compared sites seem to be widely dispersed, the final considerations are consistent and well-argued. A more theoretical chapter by D. Wolski contemplates the dichotomy concept of late industries as a reflection of social processes and changes in the studied period. It should be noted that the opportunistic *ad hoc* tools with unspecific short-time use-wear are common even in Neolithic collections, i.e. it is not something unique for late industries, but perhaps not so prominent as it is hidden behind steady typological tools, organised cores and blade production of Neolithic collections. A final consideration of the site's status clearly distinguishes the Stránská skála IV site from the mining region in Krumlovský les Upland. Whereas the Krumlovský les mining district was connected with a symbolic motivation regarding knapping activities, Stránská skála chert processing was directly practical and related to daily life.

The complete database of the lithics could be highly beneficial for many readers and, as is common in modern science, the raw data are open and presented in clearer form for individual items.

The repeatedly mentioned hypothesis of the composed dagger (from an arrowhead at the tip and segments on sides) needs more robust verification to be presented as a fact. The well documented bright spots on segment backs, no sickle or saw use-wear on their functional edge, no binding hafting wear on arrowhead, should all be presented in micro-photos at least. Use-wear analyses of segments and arrowheads of the Bell Beaker culture realised recently oppose this idea.

Although some genre photos can be refreshing in an academic text, they should not be mixed with those which are more documentary in scope. Figures V.3-8 and IX.6 were not well processed and need more care. They should be re-drawn in higher resolution. Deeper final editing could be beneficial because mistyped characters are more frequent than usual, and some might be confusing.

Despite these details, the new Stránská skála book is a beneficial contribution to the research of Bell Beaker stone processing in the Central European context. The comprehensive introductory chapters and expert analyses make the book interesting even for archaeologists who do not specialise in lithics.

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(review) D. Wolski. *Krzemieniarstwo wczesnobrązowe w Małopolsce w świetle analizy wybranych źródeł. Perspektywa traseologiczna* [*The Early Bronze Age lithic chipped industry in Lesser Poland in the light of analyses of selected evidence. Use-ware research perspectives*] (= *Collectio Archaeologica Ressoviensis* 42). Rzeszów 2020: Wydawnictwo Uniwersytetu Rzeszowskiego, 199 pages.

The reviewed monograph concerns the activities of Early Bronze Age farmers and breeders from the perspective of research on the traceology of flint tools. The main axis of the narrative considers the phenomenon of the dualism of the lithic chipped industry in the community at the turn of the Neolithic and Bronze Age in Lesser Poland. The publication is a shortened form of the PhD dissertation defended at the Institute of Archaeology of the University of Rzeszów.

The cover of the book refers to the title – the photo on it is a compilation of traceological micrographs prepared by the author. The work opens with an introduction. The rest of the content is divided into six chapters, and the work ends with a bibliography, an extensive abstract and a summary in English.

In the introduction and the first chapter, the author specifies the purpose of the work, i.e. the analysis of functional microtraces on flint materials from the Early Bronze Age discovered in "loess" sites in Lesser Poland. This area was chosen because of its special cultural role and economic potential in prehistory. The subject of the study were materials dated 2200–1600 BC related to the Mierzanowice and Strzyżów cultures. The author set himself the task of making a detailed analysis of representative flint products from the above-mentioned cultural contexts. At the outset, he draws attention to the technological duality of selected assemblages – on the one hand, technologically advanced bifacial tools, and on the other, simple flake forms. The author believes that the observed bipolarity probably resulted from needs related to specific economic activities.

The aim of the work was therefore to define the way of using tools and to understand the reasons for their technological and functional distinctiveness. For the analysis, the author chose flint tools considered representative of the cultural groups of the geographical area in question. He considered it important to carry out their morphometric, typological, and raw material analysis, as well as to conduct experimental tests which would be helpful in determining the functions of the analysed products. Products from settlement and sepulchral sites were analysed in terms of typological categories, regardless of their place of origin.

Chapter II of the publication – as the author points out – concerns the methodological solutions adopted in this work. Addressing the issues of the history of traceological methods, the author refers the reader to both foreign and domestic literature. He presents issues related to optical microscopy, the multi-stage inference procedure and the research equipment used. To research hundreds of flint products, he used light microscopes and used high-class equipment available at Institute of Archaeology in Rzeszów University.

He also considered the method of cleaning remains important in terms of methodology and used a non-invasive method employing ethyl alcohol. He also emphasized the important role of the proper documentation of data, postulating the need for a standardized form of descriptions. In order to meet the demand for detail, he created cards with a multifaceted description of the examined monuments, and also described the model of the adopted research procedure, presenting it in the form of a diagram in the figure. He emphasized that some assemblages were selected in a chronological and adequately representative manner for the analysis. Importantly, he drew attention to

the factors accompanying traceology as important in determining the functions of individual tools.

In this chapter, he also explained the ambiguities regarding research terminology and provided a definition of terms important in the analysis. He broadly discussed the concept of a tool, taking into account its typological and functional classification. He also emphasized the importance of experimental tests that would support the hypotheses put forward in them. Thus, in order not to duplicate the work already done by other researchers, he opted to conduct relatively few experiments.

In Chapter III, concerning the characteristics of the lithic chipped industry in the Lesser Poland loess areas in the Early Bronze Age, the author carries out a critical analysis of the sources, as a result of which he distinguishes the features of this production. He considers the selection of typical Bronze Age forms necessary for the correct inference about the function of flint products. Therefore, he reviews representative and chronologically certain inventories and cites elements of the flint-making of the Corded Ware culture as a unit preceding the settlements in Mierzanowice and Strzyżów cultures. He draws attention to the problem of the non-homogeneity of certain sets and the related risk of incorrect dating and incorrect functional interpretation of a given set of remains. It also signals a problem with the cultural connection of materials from mine and workshop sites. The author, while reviewing certain inventories chronologically, emphasizes that they have not been subject to traceological observation in such a wide range thus far.

In the first subsection, he presents the history and state of research on the lithic chipped industry of the Early Bronze Age in Lesser Poland. He draws attention to the work of subsequent researchers who contributed to the identification of flint-processing in the region and signals the moment when the bipolarity of the development of flint technology was noticed.

The next subsection deals with the characteristics of sources and their types. The author describes in turn the most important funeral, settlement, and mining sites, important from the point of view of research on lithic chipped industry of the Mierzanowice and Strzyżów cultures. He discusses the resource economy, based mainly on nearby deposits, less often on the distant ones. He introduces the flint techniques used, starting from the techniques related to obtaining the raw material and the preparation of tools.

The next subchapter defines the typological features of the created tools. The author – based on the literature from the end of the 20th century – writes about the abandonment of the production of standardized tools in the Early Bronze Age, which took place in the Neolithic period. He draws attention to the phenomenon of transforming chronologically older tools to meet local needs and notes that all products, even scrap ones, were used as tools.

The sixth subsection deals with the issues of macrolithic bifacial forms. The author discusses their chronology and scope, as well as morphological and technological features. The author discusses their chronology and extent, as well as morphological and technological features. We learn from it, among other things, that the production of bifacial forms in Lesser Poland began in the early phase of the Mierzanowice culture and was completed by the end of the Early Bronze Age. In turn, the presented sickle knives began to be produced in the late phase of this culture. The author draws attention to the range of these tools. For research in this category, he uses a typological method. The uncertainty in determining the chronology, resulting from the possibility of altering the tools, prompts the author to postulate the simplification of their division. He points out that the Mierzanowice bifacial forms could be reused by the Trzciniec and Lusatian cultures. He cites the content of works describing the technology of making macrolithc backed-shaped knives and encloses an illustration with a diagram he considers more probable. He concludes that the flint-processing is very similar in the entire zone. The aforementioned dichotomy is confirmed – there are simple flake forms and technologically advanced bifacial forms.

Comparing the Eneolithic materials with the Early Bronze Age ones, the author notices some differences, e.g. in relation to the raw material preferred for various tools and typological differences. The reuse of tools became increasingly popular in the Middle Bronze Age. The author draws our attention to the contact points between the Trzciniec and Mierzanowice and Strzyżów cultures and presents the analysed features in a tabular summary. He considers bifacial forms and sickle knives to be markers of dichotomy and shows that they differ from the settlement tools in terms of technology and raw material functions.

In chapter IV, the author lists flint products selected for the traceological studies, describing the sites and the materials derived from them in the following sections. He drew attention to bifacial forms as characteristic tools, most often found in graves or discovered as loose finds. For the analyses, the author chose materials from the sites: Targowisko 16, district Wieliczka, Raciborowice-Kolonia 1 and 2, district Chełm, Orliska Sokolnickie 1, district Tarnobrzeg and loose

finds of bifacial tools from other sites. This choice was duly justified, and a list of tools is provided in the form of a table. For the analysed materials, the author has also prepared typological and chronological schemes in the form of illustrations. The Targowisko 16 site was of a domestic nature, Raciborowice-Kolonia was a cemetery associated with the Strzyżów culture, Orliska Sokolnickie 1, in turn, is a multicultural sepulchral site. The author assumed that he would confirm the functional duality of the tools in the above-mentioned sites from different archaeological contexts.

Chapter V is the main analytical part in which the author discussed the types of individual microtraces and described the principles of separating products for microscopic analysis. The analysed materials were divided according to sites, chronology, and percentage frequency. Within this framework, he described the microtraces observed in individual categories of remains.

The author described the various categories of the analysed remains in detail. He began by explaining the term used to describe a given product, and then described it in terms of typology, technology and chronology. He provided metric data, took into account the raw material and applied technical procedures, as well as the recorded microfracture transformations and diagnostic utility features. This chapter is richly illustrated.

In the analytical part, he referred to the technological and functional issues of special products, recreating the sequence of operations (*chaîne opératoire*) necessary to produce them. This multi-stage sequence of actions has been described in detail in the table. The analysis of subsequent sites was completed with an extensive summary and conclusions presented in a descriptive and tabular form. The author managed to capture the activities performed with the analysed flint tools. He observed, among other things, that the same activities were performed with different tools and vice versa, e.g. sickle knives were used to process wood, meat and plants. This is very clearly presented in the tables.

The analysed bifacial remains from the cemeteries discovered in Raciborowice-Kolonia and Orliska Sokolnickie were made of high-quality raw materials. This proves that both the Mierzanowice and Strzyżów communities used the nearby raw material, as long as it was of adequate quality.

In the summary, the author gave the percentage of microtraces registered on 411 analysed flint products. They most often indicated the use of tools for processing grain, wood, hides and meat, less often for processing bones, antlers and herbaceous plants. Traces noticed on backed-shaped knives, in turn, indicated contact with the soil. At the site in Targowisko, he noticed the pursuit of a certain standardization of forms, which could facilitate the use of tools for various activities. By discarding tools with slight traces of use, and therefore used briefly, the researcher observed that only a few percent showed clear traces. This led to the conclusion that most of them were prepared for *ad hoc* activities and then abandoned.

Chapter VI is the main interpretative part. It has been divided into five sections describing subsequent issues. The first issue concerns the form and function of artifacts in the context of comparative microscopic analyses. The first issue concerns the form and function of artifacts in the context of comparative microscopic analyses. The author noticed here the possibility of a correlation between the form and function of certain tool forms. He presented subsequent categories of typological tools and the issues related to their use. He emphasized that taking a position on the formal and functional relationship of flint tools is extremely difficult and requires further detailed research. While postulating the multifaceted work to be undertaken by the team of researchers, he also recalled his own interpretations of the functional tools.

The second issue is the interpretation of unusual traces of use based on the conducted experiments. We can read here about unusual traces observed on arrowheads and the experiment consisting in storing them in a quiver, which was meant to confirm the manner in which these traces were created.

The third subsection introduces the interdisciplinary perspective. It shows the potential elements of economic activity in agricultural and breeding communities from the early Bronze Age in the light of environmental, traceological and ethnographic findings. The author highlights a number of elements of economic activity, such as soil preparation for cultivation, harvest and threshing, animal husbandry, preparation of food and dishes, processing of organic materials and inorganic raw materials, preparation of armaments. The author comes to several conclusions. Among other things, he noticed that certain tools that were involved in the performance of certain seasonal jobs were carefully made, and the signs of use were very distinct. On the other hand, the tools used for *ad hoc* work were quite simple and the traces of use were poorly visible. After use, they were probably thrown away, so easy access to the raw material was important.

In the next section, on the example of Targowisko 16, the author presents the role of flint tools on the Early Bronze Age settlements, taking into account

other traceological interpretations from Europe. He showed the aspect of everyday use of tools and emphasized the important role of lithic chipped industry due to the lack of copper and bronze tools. He showed that at the Targowisko 16 site, manufacturers showed pure pragmatism, making tools quickly, often without retouching the edges.

In the last section, the author deals with the interpretation of macrolithic bifacial forms in the context of traceological findings concerning other areas of Europe. He considers the nature of their manufacturers, users, and the practical significance of these tools for the Early Bronze Age communities in Lesser Poland. He emphasized the fact of the deepening duality in the development of flint-processing, which was already visible at the beginning of the period. The author, writing about the Early Bronze Age Lesser Poland, showed it against the background of Europe. Here we find references to numerous publications in which traceology plays a significant role. As an example of the bipolar development of the lithic chipped industry, the author mentioned Scandinavia, where the specialized tools were long, backed knives, and common forms made on flakes. He showed Scandinavia, unlike Lesser Poland, as an area with a broad source base, suitable for conducting in-depth studies. He also noticed a similar dualism in the Netherlands, where the same specialized tools were discovered as in Lesser Poland. The author introduced the reader to the directions from which the imports came here and the places where they were found. He also presented interesting hypotheses explaining the frequent occurrence of flint sickles as loose finds.

The author describes the presented traceological study on the Early Bronze Age materials as a set of probable hypotheses, based on theoretical and empirical grounds. At the end, he expressed the hope that this work will be a contribution to further studies. He emphasized that the analyses carried out in it take into account the entirety of flint-processing, and their aim was to test the most likely way of using the tools. The author assessed that he achieved the intentions of the work despite the shortcomings of the source database. He managed to determine the production and functional course of the analysed forms. Thanks to the extensive research process, he demonstrated the multifunctionality of tools used cyclically and the existence of *ad hoc* tools for one function, which is an important achievement of this work. He emphasized that the essence of terminal lithic chipped industry is most visible precisely in the double-track development of flint-making.

The publication provides a comprehensive look at the activities of representatives of the Early Bronze Age communities. The author expressed the conviction that a valuable supplement to his achievements would be research conducted by representatives of other fields related to archaeology, which would complement the attempt to comprehensively look at the activity of farmers and breeders from this time.

The author concluded the prepared monograph with a rich bibliography and an extensive summary in English. The work has a high cognitive value, although there are a number of threads in it that require further development, something which the author himself highlights. The axis of the narrative is the dualism in flint production, which is repeatedly and consistently referred to in this work.

We will also find here a multitude of conclusions, endings, and summaries. It sometimes give the impression of overwhelming the reader with too much information, but the cyclically repeated conclusions remain in the memory for a long time, and the publication itself is suitable even for occasional use, because each of its parts reflects the meaning of the whole. Readers wishing to broaden their knowledge of the Early Bronze Age lithic chipped industry in Lesser Poland will find a wealth of literature here. The work is written very meticulously and methodically. The author's ambition, which was to put forward further theses and lead the logical course of argumentation, was fulfilled here. This publication undoubtedly makes a significant contribution to the state of the art concerning terminal flintwork.

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(review) J. T. Frazik. *Zamek w Krasiczynie* [*The castle in Krasiczyn*]. Przemyśl 2020: Przemyskie Centrum Kultury i Nauki ZAMEK, Towarzystwo Przyjaciół Nauk w Przemyślu, 200 pages, 200 figures.

In 2020, the ZAMEK Culture and Science Centre in Przemyśl (Przemyskie Centrum Kultury i Nauki Zamek) together with the Przemyśl Society of Friends of Science (Towarzystwo Przyjaciół Nauk w Przemyślu) published a book entitled *Zamek w Krasiczynie* (i.e. *The castle in Krasiczyn*). The work in question, which was written by Józef Tomasz Frazik, is a re-edition of the monograph of the same title, published in 1968 in Zeszyty Naukowe Politechniki Krakowskiej, no. 12, as a part of Architektura series, no. 22 (Frazik 1968). Before we discuss the reviewed publication in detail, we shall first devote a few paragraphs to briefly describing the author of the work, as well as the castle in Krasiczyn and literature pertaining to this interesting defensive-residential complex.

Professor Józef Tomasz Frazik (born March 7, 1922 in Sambir, now in Ukraine, Lviv region, died March 12, 1998 in Krakow), was an eminent art historian, architect, heritage conservator, and the honorary member of the Association of Heritage Conservationists (Stowarzyszenie Konserwatorów Zabytków). For the most part of his academic career he was affiliated with the Department of the History of Universal Architecture at the Cracow University of Technology, where he served as the Head of the Department from 1977 to 1994. His research interests included mainly Gothic and Renaissance architecture in Poland, the architecture of Islamic countries, the art and sculpture of the Przemyśl region and historical urban planning. His accomplishments include almost 180 works, articles, source materials, reports, synthetic and popular science publications and reviews. The above-mentioned scholar conducted architectural research on numerous monuments in southern Poland including Biecz, Przemyśl, Krasiczyn, Krakow, Tarnów and Dubiecko. To this day, various findings and publications by Frazik are considered up-to-date and leading in the field (see: Kowalczyk 1998, 531–536; Tołłoczko 1998, 83–84; Budzyński 1999, 158–160; bibliography compiled by Frazikowa 1998, 536–543). The castle in Krasiczyn is an establishment known by both specialists in the field of defensive and residential architecture and by enthusiasts of historical monuments. It is situated on the edge of Krasiczyn village, on the right bank of the San River. The preliminary architectural survey was conducted there by Adolf Szyszko-Bohusz in the interwar period. In the years 1963–1967, archaeological-architectural explorations of the site were carried out by Antoni Kunysz and J. T. Frazik, and in 1976 by Krzysztof Szuwarowski. The castle has been discussed in extensive yet highly fragmented literature, including academic studies, catalogues and popular science publications. The most valuable works are those which – despite being published many years ago – still contain valid findings. In this connection we should mention the comprehensive and highly valuable monograph about the castle by Mieczysław Zlat (1963), who was the first scholar to provide a thorough overview of the state of research, discuss the origins of the Krasicki family, present the genesis of the castle's construction and the creation of the town and stratify the residence chronologically. Next, we shall touch upon Krzysztof Wolski's (1962) study devoted to the history of the castle, the village and the Krasiczyn latifundium, and finally J. T. Frazik's (1968) work cited above. In addition, a mention should be made of the articles by Kunysz and Andrzej Koperski which present the results of archaeological research (Kunysz 1966, 106–111; Koperski 1967, 157–161), catalogue studies by Stanisław Kołodziejski (Kajzer *et al*. 2010, 246–250) and Bohdan Guerquin (1974, 167–170), as well as synthetic works by Michał Proksa (1994, 231–235; 2001, 272–275).

According to current state of research, the castle in Krasiczyn was built in the middle of the 16th century (1550) on the grounds of Śliwnica village (later incorporated into Krasiczyn) on the initiative of Jakub from Siecin. The original residence consisted of a wooden-earth fortification in the form of ramparts and palisades arranged in the shape of a quadrangle and a wooden inner structure. The only brick object was the gatehouse – a rectangular building measuring 9.80 x 13.20 m, located in the northern wing of the castle. Beginning in approximately 1580, Jakub's son Stanisław Krasicki, initiated a major expansion of the residence and erected a vast bastille-type castle. The establishment was built on a 70 m square plan, with a large courtyard, four bastilles in the corners and a house located along the northern curtain of walls and a gatehouse. The final shape of the residence was determined under the supervision of Marcin Krasicki, in the course of works carried out in three stages between 1598 and 1633. At that time, a further part of the building was added to the western side of the northern wing and a new two-storey residential wing was erected in the east. The curtain walls were also raised, while the corner fortified towers were extended and named after four symbols of power: the southwestern was known as the Divine, the northwestern Papal, the northeastern Royal and the southeastern Noble. The old entrance to the castle was removed and replaced with a new one, in the form of a building with a tower and a foregate; this structure was located in the west wing. The cloisters surrounding the courtyard, the Mannerist interior design and the facade decorated with sgraffito ornaments all added a residential character to the building. In subsequent years, the castle underwent further alterations and repairs; however, the said works did not alter its spatial layout (see Frazik 1968, 162–214; Kajzer *et al*. 2010, 246–250).

The work under review, i.e. the reprint of Frazik's study from 1968, consists of 200 pages, among which the reader may find a number of noteworthy elements. To start with, the book includes 17 fold-out inserts in A4 format which present the views of particular elevations as well as drawings by A. Rölle; interestingly, the foregoing illustrations, which have been made available thanks to the Piniński-Lanckoroński Foundation have been published for the first time. Apart from that, the scrutinized work offers large photographs of the object as well as 28 pages with illustrations showing old iconography of the castle, archival and contemporary photographs and landscapes of Krasiczyn. The book itself is divided into four main chapters, which are preceded by a short introduction from the publisher. At the very end of the monograph one may find a list of selected references, summaries in Polish, English and French, editorial notes and the above-mentioned appendices containing old iconography and photographs; the latter has been compiled by Janusz Polaczek, who was also the editor of this version of the publication, whereas the reprint revision and proofreading were made by Małgorzata Wasylów.

The introductory part – *From the Publisher* (pp. 9–10) written by Janusz Polaczek, the President of the ZAMEK Culture and Science Centre in Przemysl and Waldemar Wiglusz, the President of the Przemyśl Society of Friends of Science, contains a description of the circumstances surrounding the publication of the book and the need for such a project. It is made clear that this is not the first edition of Professor Frazik's works since a collection of his articles was published in 2004 by the Regional Centre for Culture, Education and Science in Przemyśl and the Art Institute of the Polish Academy of Sciences in Warsaw (Frazik 2004). Moreover, the authors also mention that a reprint of the study on Gothic vaults is currently being prepared (Frazik 1967). Moving on, the main part of the book opens with chapter I – *Introduction* (pp. 11–14), which contains an overview of the state of research on the castle in Krasiczyn and the literature on the subject. It is followed by chapter II – *Comments on the method* (pp. 15–25), which includes a description of architectural research methods used by J. Frazik, methods of analysing the preserved material, the brickwork of the walls and the technique of their manufacture. Chapter III – *Analysis of the building* (pp. 27–136), the largest in terms of volume, is divided into eighteen smaller subchapters: A – *Synthetic description of the existing situation* (pp. 27–33); B – *Analysis of the western screen wall, including the Clock Tower, loggia, foregate, and cloisters* (pp. 34–58); C – *Analysis of the Papal tow*er (pp. 58–64); D – *Analysis of the Divine tower* (pp. 64–71); E – *Analysis of the porch* (71–74); F – *Analysis of the south wing* (*screen wall, staircase, terrace*) (pp. 74–81); G – *Analysis of the Noble tower* (*southeast*) (pp. 81–84); H – *Analysis of the east wing* (pp. 84–93); I – *Analysis of the Royal tower* (*northeastern*) (pp. 93–98); J – *Analysis of the staircase avant-corps with the angular annex* (pp. 98–103); K – *Analysis of the "connector" stretched between the Royal tower and the so-called "Swiss House"* (p. 103); L – *Analysis of the north wing* (pp. 104–118); Ł – *Analysis of the loggia standing next to the north wing* (pp. 119–126); M – *Stonework* (pp. 126–127); N – *Woodwork* (p. 128); O – *Roof tiles* (pp. 128–132); P – *Shingles* (p. 132); R – *Tiles* (pp. 132–134); S – *Stratigraphy of the castle's immediate surroundings*

(pp. 134–136). Chapter III provides the general analysis of the architecture of Krasiczyn Castle as well as the results of the research and observations made by Frazik. In order to facilitate a better understanding of the complicated architectural and stylistic structure of the residence, the author discussed each element separately. This procedure enabled, above all, a very meticulous and detailed discussion of the individual parts of the castle. And so, the main elements of the establishment, the residential wings and the four distinctive towers are analysed first, followed by the less important components, architectural detail, and elements of internal design. Chapter IV – *Synthesis* (pp. 137–186) was divided into four smaller parts: A – *The entrance gate building to the fortalice of Jakub of Siecin* (ca. 1550) (pp. 137–142); B – *The so-called bastille-type castle of Stanisław Krasicki* (ca. 1580) (pp. 142–162); C – *The Mannerist residence of Marcin Krasicki* (1598–1614, 1614–1618, 1618–1633) (pp. 163–177); D – *Reconstructions, renovations and conservation works since the XVIII c. until 1967* (pp. 177–186). The chapter under scrutiny offers a discussion on the four main chronological phases of the castle connected with the modifications of the spatial layout and its subsequent expansions. The analysis of the object is presented in the broader context of the transformation of defensive and residential constructions in Europe and the Middle East in the final phase of the Middle Ages and the beginning of modern times. In this context, it should be mentioned that the author repeatedly referred to analogies from the lands of Przemyśl, Sanok, Lesser Poland, and Rus in his research. This analysis is followed by a selection of the most important literature (pp. 187–194) used in the publication as well as short summaries in Polish (p. 195), English (p. 196) and French (p. 197). The final part of the book consists of Editorial Notes (pp. 199–200), which include a summary, acknowledgements, and a modest list of recent literature.

The work also includes black-and-white illustrations. These are drawings depicting plans of the particular parts of the building, models showing the appearance of the castle in various phases, architectural details, as well as photographs taken during archaeological and architectural research (164 in total). An additional collection of graphics and photographs is included at the end; it consists of 5 large inserts in A4 format with Rölle's watercolours from 1837 presenting the wings of the castle, 4 inserts of the same format with bird's-eye views of the residence, old iconography and photographs of the building from the mid-18th century to the late 1980s (24 figures in total), 3 depictions of Krasiczyn landscapes by Marian Stroński and Leonard Pękalski, as well as 18 contemporary photographs.

Moving on to the review of the discussed book, it is necessary to stress that the core content of Frazik's work will not be subject to substantive assessment, as it is analogous to the first edition from 1968. It should also be emphasized that Frazik's work is of high merit and has not lost its relevance and topicality despite the passage of years. Indeed, the first edition of *Zamek w Krasiczynie* was very well received by the scholarly community; however, it did not undergo a critical review. Still, reviewing its substantive content seems unjustified, considering the lack of any differences between the contents of the 1968 and 2020 editions.

What needs to be addressed, however, are the technical and editorial issues noticed upon reading the 2020 version. The reprinting of the book was a laudable effort, as the first edition was rarely available on the market and could only be obtained in few libraries. The reasons for this situation lie in the limited print run and the modest editorial form, akin to a typescript, which unfortunately fostered the rapid physical deterioration of the book. Unfortunately, many typos and spelling or stylistic mistakes were not corrected during the republishing of this significant work. Among the most noticeable and glaring ones we shall mention the following: on page 12, in the second paragraph, fourth line, the word "nurów" (i.e. divers) should be replaced with "murów" (i.e. walls); on page 22, in the second paragraph, in the last sentence, the word "publikacja" (i.e. publication) is repeated twice; further on page 45, in the second paragraph, fifth line, the word "budcwa" should be replaced with "budowa" (i.e. building). On page 54, in the second paragraph, in the third line from the end, we encounter the word "akieplennych", which should be spelled "sklepiennych" (i.e. of vault), then on page 94, in the first paragraph, the eleventh line, we have "wyniarów", which should be "wymiarów" (i.e. measurements). On page 113, in the second paragraph, the fifth line, we have "brany", which should be "bramy" (i.e. gates), on page 119, the fourth line, we have "kopulsto", which should be "kopulasto" (i.e. dome-like). Yet another major error can be found on page 132, in the second paragraph, the sixth verse, where "soisłego" is used instead of "ścisłego" (i.e. strict); on the next page, in the first paragraph, the word "ćwiećkulistą", while it should be "ćwierćkulistą" (i.e. quarter-spherical); three pages later, in the first paragraph, the word "wypełniło" (i.e. filled) occurs, which should be replaced with the word "wypełnisko" (i.e. the fill). Another mistake was made

on page 137, in footnote number 64, where instead of "byłoby" (i.e. would) we encounter "tyłoby"; in footnote number 66 on page 139 there is an incomprehensible phrase "XVI/XVU1 century", which should rather read "XVI/XVII century"; in the same footnote we see "umiej starannie" instead of "mniej starannie" (i.e. less carefully). Another mistake appears in the description of figure 107, on page 138, as the name of Krasiczyn is misspelled as "Krasiczyn". Moreover, a typo appears on page 161, in the first paragraph, verse 5 – there is "kościoŁOy", while it should be "kościoły" (i.e. churches); finally, in the Polish summary, on page 195, under point number 3, the dates were indicated incorrectly as 1818–1633 rather than 1618–1633. This is, of course, only a selection of errors and mistakes; there are many more in the book, e.g. double spaces or the lack thereof, improper inflection, repetitions or misprints. It is a real pity that the editors of the second edition of the book did not correct the errors in the original text but only "copied" it. I think that Professor Frazik himself would have been dissatisfied and preferred to eliminate these shortcomings.

Among the remaining faults of the reviewed work we should first of all mention the poor quality of the original drawings and photographs, which were reprinted directly from the source material. Very often they are barely visible and illegible, e.g. in the description of fig. 24 on page 46 it is stated that the wall shown in the picture has a grid of squares measuring 50 cm, but in reality it is not visible. One can only regret that upon publishing the reprint of this work the editors did not try to obtain the original figures (e.g. from Professor Frazik's private collection, kept by his family or from the Cracow University of Technology). Surely, reprints of the authentic works would have produced a much better result. In addition, the editors did not thoroughly check the manuscript before printing it, as the book includes unremoved technical comments that should not appear in the final version. For instance, on page 127, in the footer, we see the phrase "czy to właściwe odwrócenie???" (i.e. is this the right inversion???). Also, it seems quite unfortunate that Frazik's original work was not preceded or followed by a text by a specialist in the field of defensive and residential construction (an architectural historian, castellologist), who would describe the current state of research, present information on the castle in Krasiczyn and discuss the latest literature. The editorial notes provided at the end of the book do not fill this gap and the works cited there, such as those by Inga Platowska-Sapetowa (2002), Tadeusz Rudkowski (2006), or Roman Aftanazy (1991), constitute only a small percentage of the new literature on residences (and not the most important, either). Missing from this collection are, above all, the catalogue works of Guerquin and the team led by Leszek Kajzer, as well as the studies conducted by – among many others – Proksa, all of which were cited in the earlier part of this review.

In conclusion, despite the numerous technical shortcomings (editorial comments, poor quality of figures) and errors (typos, stylistic mistakes, repetitions) the reprint of the 1968 monograph on Krasiczyn Castle by Frazik was a splendid idea. It has already been pointed out that the original work was published in a very limited run and is now hardly available. The 2020 edition is likely to attract a broader scientific community and it may stimulate the curiosity of scholars interested in this fascinating building. Given that the castle in question is particularly important in the history of defensive and residential constructions, we may soon expect new attempts to analyse it. One of the greatest advantages of the new edition lies in the inclusion of historical iconography and archival photographs, which were previously fragmented and relatively unknown. The same argument holds true for the five watercolours by Rölle, which have not yet been published and made available to a wider range of researchers. The reviewed book should therefore be recommended to any reader interested in this issue.

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