Archaeologia Historica Polona
vol. 28, 2020, pp. 61–75, ISSN 1425–3534, DOI: 10.12775/AHP.2020.003

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Archaeological settlement research for the late Middle Ages in Poland

Abstract. Archaeological settlement research in Poland has to date not been conducted on a large scale. The remains of medieval villages have usually been excavated when rescue works were required by construction projects – usually along the routes of planned highways. Traces of farming have been discovered only by chance, and research on the distribution of land uses has mainly been carried out by geographers. In a few cases, survey excavations of rural settlements have been carried out in the vicinity of defensive structures being investigated. In cities, even long-term studies have basically been limited to researching only the densely built-up zone, the market square, and defensive walls. Neither agricultural land owned by townsfolk nor the zones outside the city proper that they used economically have been examined.

The surface research resulting from the campaign Archeologiczne Zdjęcie Polski – AZP (Polish Archaeological Record) is of little use for the late Middle Ages, firstly because artefacts from that period were not collected at the beginning of the research, and also because of a specific aspect of cultivation (fertilisation), which saw a considerable carrying of movable cultural artefacts out from built-up areas.

These weaknesses resulted from various factors. First of all, there was a lack of interest in such research among not only historical preservation services but also archaeologists themselves. However, the main factor was the significant financial outlays that such research requires.

Currently, archaeology has many techniques at its disposal that allow large areas to be studied and that thus allow archaeological sites to be identified and preliminarily investigated. Aerial laser scanning and ground-based geophysical methods provide much valuable data and, above all, allow places requiring excavation to be accurately identified. Unfortunately, deeming such methods to sufficiently record sites can sometimes mean that they constitute the first and only archaeological survey of a site. Then there are problems of dating such sites and, of course, we do not acquire many of the movable cultural objects that research on medieval society demands.

Keywords: archaeology, settlement studies, Middle Ages, non-invasive studies.

The above title is undoubtedly provocative. We are perhaps all aware that it would currently be difficult to write a work that was indeed true to this title. Of course, we could have used the phrase 'the state of research' or referred to the need for such research, but a little provocation in science doesn't hurt, and may even highlight the paucity of our achievements in this area to date. For there is no hiding the fact that archaeological settlement studies have not been conducted for the late Middle Ages in Poland. One exception to this is the considerable successes in studies of historic cities. However, these are usually studies of settlements within urban centres that do not link them to their outer zone; thus, they are quite fragmentary, and additionally, if some syntheses are now being made, they tend to be socio-topographical.

As we begin our article, we should nonetheless devote a few words to exactly what settlement research is. First of all, I would like to recall some of the first theoretical studies on this subject (perhaps the very first), which were written by a Polish archaeologist, and which now seem to be somewhat forgotten. I am referring to four articles by Stanisław Kurnatowski that appeared in print in the years 1965–1978 (Kurnatowski 1965; 1973; 1977; 1978). In all these works, settlement studies are part of geographical and socio-historical sciences – according to the terms used by the researcher. These works were recently discussed in an article by Henryk Mamzer and dedicated to the memory of Professor S. Kurnatowski, relieving me of the need to provide a more detailed analysis of them here (Mamzer 2015). However, I would like here to recall the professor's views expressed in other works that do not go under the aegis of 'settlement research'. He was inclined to criticise the approach that overestimated environmental determinism. In such an approach, archaeologists are much closer to those studying historical times, rather than those looking at earlier periods. Those first publications made people realise for the first time how complicated this subject is and how many scientific disciplines researchers should be employing in such studies. In his works, S. Kurnatowski referred not only to the achievements of environmental sciences, history and sociology, but also to philosophy, cultural anthropology, ethnology and economics. As a complete novelty, he attempted at that time to apply achievements in cybernetics to create settlement models.

As I mentioned above, these articles are not often cited in works by Polish archaeologists. When we need the support of some sort of theoretical reflections, we more readily refer to Herbert Jankuhn's book 'Wprowadzenie do archeologii osadnictwa' first published in Poland in 1977 (Jankuhn 1977; 1983). I do not want to deal here with the methodology or history of archaeology, however, especially since the works cited concerned mainly prehistoric and early medieval archaeology. I have written more than once that current archaeological methodology is entirely uninterested in the study of fully historical epochs. It is therefore difficult to cite here works that might constitute a theoretical basis for such research. Such a role cannot

be fulfilled by Stanisław Tabaczyński's work 'Archeologia średniowieczna', because it mainly relates to issues of relevance to the Early Middle Ages (Tabaczyński 1987). I am far from claiming that those researching historical epochs do so without theoretical reflection, but they do not typically consider methodological issues. Many such works can be cited here. Two books by Leszek Kajzer: 'Zamki i społeczeństwo' and 'Wstęp do archeologii historycznej w Polsce' (Kajzer 1993; 1996) should be considered among the first, and consider the problems of younger ages by far the most extensively. They are equally archaeological and historical works. Cooperation between researchers from these two disciplines is crucial for this period of our history. It began in Poland before the Second World War. It seems that Gabriel Leńczyk, commissioned by the Polska Akademia Umiejętności – *P*AU (Polish Academy of Arts and Sciences), began excavations in Piekary near Kraków in 1932 and these works culminated in an interdisciplinary publication (Leńczyk 1933; Jamka *et al*. 1939). There is not enough room here to discuss similar works and their stories. Let us then proceed to attempting to outline the specifics of late medieval settlement research.

The first basic difference that emerges, and one that is usually a defining characteristic of the period, is the emergence of more abundant written sources. This, of course, puts the archaeologist and the historian on a level footing in creating our view of this epoch. This, at least, is how archaeologists see it, as medievalists do not always appreciate our contribution to the research. The participation of representatives of the environmental disciplines is as important as it is in studies on earlier eras, but the tasks that late medieval settlement research demands are slightly different – I have already mentioned the sceptical attitude towards environmental determinism that the works of S. Kurnatowski take. Of course, discussions on this theme far predate even his work. We should mention here the almost cult works of Fredrich Ratzel (1882) or Paul Vidal de la Blache (1948) of the French socio-geographic school. The evolving discussions between environmental and humanistic determinism prompted the development of modern historical geography (Labuda 1953). A brief summary of sorts was provided relatively early (already in 1967) in a work by Henryk Łowmiański (Łowmiański 1957, p. 15). Currently, the best review of the issues related to the human-environment relationship in the Middle Ages is reported in the studies of Jan Tyszkiewicz (1981, pp. 7–33).

Let us return, however, to how the late Middle Ages differed from preceding eras. Throughout history, the most important factor determining where humans chose to settle was, in the broad sense, environmental resources. Beginning with the climate, through soil quality, to the availability of water and building materials, but also the potential to obtain food or to exploit natural resources. However, in the case of the late Middle Ages, a new factor appeared that significantly limited the free choice of place to settle: private land ownership. All land was divided between the ruler, the church and the nobility and knights, and later also the urban

communes. Even representatives of the privileged classes, when choosing a place to settle, could choose only from the areas that their own estates afforded them. As in earlier eras, we can distinguish here residential settlements, cemeteries, spaces associated with the acquisition of raw materials, including arable fields and crafts, and places of worship. What changed significantly in the late Middle Ages was the considerable diversity in these fundamental places of human activity. People lived in both tiny villages and large villages. In huge strongholds, but also in small fortified manors. Urban centres emerge and rapidly diversify. Sites associated with the extraction and processing of raw materials also become more diverse, but most of all they acquire a permanent infrastructure, and often very nearby settlements. Over the course of several centuries, cemeteries became connected to churches – the official places of worship – which also differ greatly in size. They range from small wooden churches to large facilities associated with, for example, monastic property. These changes are extremely important, and it is probably not common knowledge that it is at this time that the cultural landscape we know and consider natural comes into being. This is perhaps why interest in the landscape as a whole is not so great, and both archaeologists and historians restrict their research to particular types of places, losing sight of the fullness of the newly created distribution of land use.

As I mentioned above, archaeological studies on historical cities in Poland are in good health. Although archaeologists struggle with many legal and organisational problems, as L. Kajzer once wrote, and as recently summarised by Marek Florek, the proliferation of major construction projects, and the preliminary studies they entail, are increasingly translating into publications covering every aspect of the life of residents (Kajzer 1996, pp. 178–179; Florek 2018). It is a pity that we do not always find such excellent works as are featured in periodic publications on Wrocław, Kołobrzeg, Gdańsk or Stargard, but some of the research models and the standards developed in these series will probably also bear fruit for other locations. I am aware that it depends not only on the willingness of researchers, but also on the status that a city held in the Middle Ages and the amount of research that has managed to be conducted. Another important issue is the fact that the cities cited above grew intensively from the moment of their foundation and quickly exceeded the borders designated for them at that time. This is a measure of their success, but in the case of potential settlement studies, it can be an obstacle, as the original purposes of specific parts of the urban centre proper and its immediate vicinity were in most cases permanently obliterated. One might say that success at any stage of a city's development in a sense hinders the work of archaeologists wanting to conduct more extensive, in-depth settlement studies. We may recall here the classification of urban centres proposed by Maria Bogucka and Henryk Samsonowicz in 'Dzieje miast i mieszczaństwa w Polsce przedrozbiorowej', but cities that were not major centres in the Middle Ages (categories III and IV of this

classification) may have developed over time (Bogucka, Samsonowicz 1986, p. 108). We are also familiar with the inverse case – the collapse of centres that had initially developed dynamically. Paradoxically, this latter case transpires to be far more conducive to our study.

I am not aware of any recent work summarising archaeological research in medieval cities across the entire country, but the range of issues of greatest interest to researchers is quite well illustrated by the table of contents of a book published over 10 years ago under the title 'Stan badań archeologicznych miast w Polsce' (*Stan badań* 2009). Unfortunately, the results of the first symposium on these issues in Kraków in 1979 are hard to come across as they were published by the niche publisher Informator PKZ (*Archeologia w badaniach* 1980). Of course, works on individual regions of Poland and particular types of cities do turn up. Considerations of length preclude my describing them all here, but some examples include synthetic publications for Śląsk (Silesia) by Marta Młynarska-Kaletynowska, a collective work on Wielkopolska (Greater Poland) or a study of small towns in Pomorze Gdańskie (Gdańsk Pomerania) by Michał Starski (Młynarska-Kaletynowska 1980; 1995; Starski 2015; *Archeologia miast* 2016). All these works portray a similarity of researcher interests. These are, primarily, urban layout with particular emphasis on the size of the city plot and constructions on the market square, followed by the course of defensive walls and their construction. Of course, the material culture of inhabitants is also important, and above all the potential dating of the beginnings of an urban centre. Researchers looking at urban planning and architecture approach the subject slightly differently. Here, cooperation between archaeologists and architectural historians is excellent. The names of outstanding researchers would take too much space here, but I can refer, for example, to the excellent works of Jerzy Piekalski. The more synthetic issues include, as I have mentioned, sociotopographic studies, which historians undertake more often than do archaeologists (Wiesiołowski 1982; Sowina 1991; Czaja 1992; Bartoszewicz 1997; Goliński 1997; 2002; 2003; Mikulski 1999; Żurek 2015; Głąb 2017). However, such studies usually devote only a small section to the Middle Ages – which is somewhat obvious due to the lack of sources – and the lion's share goes to considerations on early modern history.

As I noted earlier, chartered cities that for some reason collapsed or did not develop beyond their original formal boundaries can be rewarding subjects for field research. That many such towns exist is convincingly argued by a work on failed chartered cities and lost cities in the middle Warta and lower Wełna basin (Brust 2019). It is just such cities that lend themselves to settlement studies, in which, besides the city itself, the research should cover its surroundings, which are of course an integral component of the urban organism of great significance to its inhabitants. After all, we know that a city was sometimes surrounded by large

areas additionally, and the charter itself often included items that significantly influenced areas beyond the city.

Of great interest to us are urban land stock, i.e. areas outside their borders that were granted to cities upon incorporation. They included arable land, meadows, pastures, gardens and forests. Sometimes these areas were truly significant, extending to over 100 łans (Lat. *Laneus* – approximately 17–25 hectares) (Koter, Kulesza 2008, p. 265). Unlike in the larger, richer cities of Western Europe, where crafts and trade provided a living for bourgeois families, in medieval Poland agriculture was an important source of livelihood for most of the bourgeoisie (Koter 2015, p. 128). Recall that they had their own fields and gardens, but also barns, and sometimes shared pastures or places for bleaching linen or gathering clay. The heavily economically exploited areas around cities often exceeded the area of strictly urban development in size. Additionally, the specifics of the three-field crop rotation system used in arable farming meant that owners' plots were not contiguous. These were often long, narrow strip plots, which later had a huge impact on the development of buildings in those cities, when their rapid growth caused the heavily built-up area to expand outwards (Koter 2015, p. 129). Unfortunately, neither archaeologists nor historians have devoted much attention to these issues to date (Blusiewicz *et al*. 2013). We have geographers to thank for producing the most works on this subject.

The impact of the urban centre on surrounding settlement, reached far beyond the land stock, however. An excellent example can be found in the charter issued by Henryk III the White for Żmigród in 1253, in which we read: 'We also promised that there will be no inn within one mile of the city, nor can a smithy, nor a shoemaker, nor a seller of bread or meat, nor others such settle within this region' (Sokołowska n.d.[1]).

And thus we come to the typically rural zone. The state of research is much poorer for villages than for cities. Of course, first we should consider what a medieval village was, and this question is not easy to answer. Norms are proposed most abundantly by researchers of the early Middle Ages – for this period the task is one almost exclusively for archaeologists supported by environmental sciences. However, the later period requires, above all, in-depth cooperation between archaeologists and historians.

So far, the literature has seen very diverse proposals, beginning with very broad ones in which everything that is not a city is a 'village' settlement (Poliński 2003, p. 6). This approach nonetheless leaves no room for defensive seats (gord-type fortified settlements, manors, castles), churches, cemeteries, manufacturing facilities, or places for acquiring raw materials. On the other hand, a narrow definition – a village in the modern definition – also fails to resolve the problem. An attempt to clarify this concept can be found in the work of H. Jankuhn and

[1] https://www.archiwa.gov.pl/images/docs/referaty/dorota_sokolowska.pdf. (dostęp: 01.09.2020)

L. Kajzer (1993) tried to put this subject in some order in his 'Wstęp do archeologii historycznej w Polsce' (Jankuhn 1983, p. 101 *ff.*; Kajzer 1993). In 2011, Tadeusz Poklewski-Koziełł attempted a summary, and a year later the complex meanders of these considerations were taken in hand and presented by Krzysztof Fokt (Poklewski-Koziełł 2011, pp. 13–21; Fokt 2012, pp. 15–17).

The study of rural areas has not yet enjoyed popularity among archaeologists. There are probably several reasons for this. Such studies do not usually produce very spectacular results, neither in terms of remains of buildings nor the relatively poor material culture. Additionally, their lack of a clear marking in the terrain makes such settlements difficult to locate. Unfortunately, we cannot expect to gain any information on the distribution of late medieval villages from the AZP sheets. We know that in the early days, potsherds from that period were not collected, and even if they were, they were usually rejected by the relevant committee, which sometimes even explicitly accused researchers of deception. So, when using AZP records, some sort of knowledge from beyond the written sources is required, and dates and researcher names must be borne in mind in order to divine the types of data that may not have been recorded. We can afford no room for a more in-depth criticism of the results of the entire AZP campaign, and these issues have often been commented on and discussed. An overview of previous publications can be found in the 2018 *Kurier Konserwatorski*, which was entirely devoted to this subject (*Kurier* 2018).

Unfortunately, the publications on the methodology of surface exploration and instructions on its conduct contribute little to the issues being discussed here. Once again, I must propose that late medieval settlement differs significantly, and that such research thus requires a completely different approach. Admittedly, in her 1998 work, Danuta Jaskanis drew attention to the need for a different treatment of late-medieval and modern sites, emphasising the need to conduct a query in the historical sources, and L. Kajzer wrote about it many times, but neither contains proposals for a more comprehensive approach to such research. I will return to this issue at the end of this text (Jaskanis 1998, p. 18).

We are all aware that in the late Middle Ages, completely new forms of rural spatial organisation appeared. I have in mind, for example, the economic base of knightly manors, which later become folwarks. There is an entirely different form of land management on lands belonging to monasteries, such as the autarkic Cistercian latifundia or the estates of knightly orders. There are many more similar such issues. First of all, we still know too little about the changes that took place in connection with the wave of colonisation that probably changed much in rural settlement beginning in the latter half of the 13th century. This is an area deserving of action for both archaeologists and other researchers of settlement – both historians and geographers.

Citing the published research results on 'rural settlements' will not take too much space. These are most often sites that have been tested along the routes of road infrastructure projects. And so, along the route of the A4 motorway, we can mention Strzeln and Wikowice (Daszkiewicz 2007; Nowaczyk, Nowaczyk 2007). Meanwhile, the A1 construction route has given us traces of other villages in Pomorzanki, where, in the neighbouring village of Pomorzany, more relics were found that were interpreted as an aristocratic folwark (*Centrum* 2013). The construction of another motorway (A2) also brought some interesting discoveries. Excavations were carried out in, among other places, the town of Sługocinek, where the remains of residential buildings and traces of economic activity were discovered. The dating of this site is quite broad – ranging from the late 14th century to the early 16th century. These dates were established based on movable cultural artefacts found in the excavations. Besides numerous potsherds there were also metal objects – knives, adzes and nails, but also a pair of spurs, a belt buckle, a crossbow bolt, an iron brooch and a silver ring, plus a hoard of silver coins consisting of 1.950 specimens (Krzyszowski 2005). However, such a set of moveable finds would suggest that this was no ordinary village settlement, but, rather, the economic base of a knight's court the remains of which should be sought in the immediate vicinity. We also record sites of interest during other interventions. This happened, among other places, in the towns of Dopiewo and Suchy Las in the Wielkopolska (Greater Poland) voivodeship, where relics of late medieval settlement were discovered (Pawlak, Pawlak 2005, pp. 253–273).

However, this general shortfall in the amount of research is beginning to be compensated. There are two regions in Poland where it has been attempted to analyse a rural settlement in its entirety. These are areas for which historical written sources have been preserved more abundantly than other regions of the country. These are Chełmno Land and Dolny Śląsk (Lower Silesia). In the former, however, much of the work is on issues related to the functioning of gord-type settlements (strongholds), castles and folwarks (Poliński 2003). On the other hand, in Dolny Śląsk, an extremely interesting settlement analysis has been conducted with particular emphasis on peasant settlements by K. Fokt (2012). The study presents data on 218 sites that were field tested to varying degrees. This is the first work of its type in Polish archaeology, and can without exaggeration be described as 'grassroots' work, because the author used his own experience in desk research to provide important tips for researchers wanting to undertake similar studies in the future. Recently in Śląsk (Silesia), too, another extremely valuable initiative that was innovative for Poland has been undertaken – work began on a 'Słownik wsi *śląskich* w *średniowieczu*', with volume 1 appearing in 2014 (*Słownik* 2014). The authors of the publication gathered information from written, cartographic and archaeological sources.

The most frequently researched objects from the period we are interested in are defensive structures, especially castles and fortified manors. Unfortunately, they are usually studied in isolation from their economic and human support structures. More comprehensive excavation works are truly rare. We can mention here research carried out in Kuyavia (Kujawy): in Kościelna Wieś in 1987–1988 by L. Kajzer, where apart from fan-shaped gord-settlement remains, a brick manor and a church, the area of the neighbouring village was also covered by field penetrations and in Zgłowiączka, where, in addition to a gord-settlement remains, excavations include a medieval village with equipment for salt extraction by evaporation (Kajzer 1994; Andrzejewska 1996). In turn, some information about the village was also obtained as a result of Piotrawin's research in the Lublin region, where a 15th-century rural presbytery was discovered (Sułowska 1984).

Here we should also include a discussion of places associated with the extraction and processing of raw materials that functioned outside settlements. Such studies are still few, but they are difficult to group and discuss synthetically. I shall therefore limit myself to pointing to their existence.

Above, due to the limited scope of this work, I have tried to briefly present the situation as it stands in our country. Now let us try to identify research needs.

The obvious and primary observation is the negligible amount of research carried out on lost medieval settlements in our country. Such studies have long been postulated in the works of archaeologists. Many such studies have been carried out by our southern neighbours and constitute excellent models (Fokt, Legut-Pintal, 2014, pp. 221–224; 2016, p. 113; Marciniak-Kajzer 2016). The very interesting work of Krzysztof Fokt and Maria Legut-Pintal on lost villages in the Strzelińskie Hills (Fokt, Legut-Pintal 2016) can be considered the first more serious forerunner of such studies. The authors discussed many topics of importance to this type of settlement research, ranging from presenting a brief history of research interests in Europe and a detailed one for Śląsk (Silesia). However, the analysis itself of the studied area encompassed many key issues. It discussed ways of identifying the location and layout of a village, whose reconstruction requires the consideration of terrain conditions, which in turn involves the use of palaeogeographic research results. Meanwhile, determining a village's land stock, the system for delimiting fields (based onvarious measures of area used in the Middle Ages, e.g. łan, *niwa*), or the habitats themselves, very much involves knowledge of historical metrology. Other important issues include identifying the course of roads, and the potential identification of the non-agricultural activities of a rural population. It is also extremely important that research employ toponymics, whose importance is not fully appreciated despite the history of archaeologists' interests in the subject being quite long (Kowalczyk 1992; Młynarska-Kaletynowa 2011, p. 98; *Słownik* 2014, p. 8).

The research on the lost villages of the Strzelińskie Hills, which I briefly referred to above, was conducted using primarily non-invasive research.

The possibilities that new research techniques afford cannot be overestimated for settlement studies. Several spectacular discoveries of recent years can be cited here that would not have been possible without modern technologies. For example, the discovery of the lost town, village and manor house in Niedźwiedziny (formerly Zwanowie) in the district Wągrowiec. Marcin Krzepkowski, Marcin Moeglich, used aerial prospection methods and observation of vegetation markers to attempt to reconstruct the plan of the lost town and to identify the layout of the neighbouring village (Krzepkowski, Moeglich 2014). This type of discovery allows for settlement research in the, literally, wider sense – an entire microregion can be analysed. In the case in hand, a whole range of non-invasive methods was used that allowed subsequent excavation works to be planned for (*Dzwonowo* 2017).

Another excellent example is that of several fan-shaped settlements analysed on the basis of a Digital Terrain Model (DTM) by Jerzy Sikora and Piotr Kittel, who pointed out that the visualisations in many cases clearly show separate areas surrounding or adjacent to fan-shaped embankments. They exhibit traces of embankments or moats, or only a slightly elevation in the terrain (Sikora, Kittel 2017). This clearly shows how fragmentary and incomplete our field research of such objects has been so far, and how incomplete our knowledge on this subject thus is (Marciniak-Kajzer 2018a; 2018b).

These are two examples that probably well illustrate how modern techniques can significantly contribute to research developing significantly faster or even acquiring a completely new quality. This is of course dependent on their being used constructively, and not being treating as mere illustrations. In this context, we can try to indicate which issues relating to late medieval settlement research should remain in the realm of archaeological interest.

It seems to me that it is extremely important to emphasise the distinctiveness of historical epochs even from the initial registration of archaeological sites. I have already written about the problems related to this for historical cities. Here, however, it should be noted that traditionally conducted surface investigations will not yield meaningful results. Villages that have existed in the same place for a long time, or that have at best slowly moved to neighbouring areas, leave completely different traces. It is a truism that potsherds are spread over surrounding fields as a result of the increasingly widespread fertilisation of fields. Therefore, when beginning a search in the vicinity of a medieval village, the researcher should know, at least approximately, its location and history.

Similarly, the fact that the more precise demarcation of fields made their boundaries more permanent and that the use of equipment for deeper ploughing have meant that, under favourable circumstances, we can attempt to reconstruct their layout, and even the method of cultivation (Fokt, Legut-Pintal 2016; Solecki 2018). Of course, the most frequent observations here will be of traces of ploughing, which we can use to try to determine the type of tool used. But not only that – extremely

interesting information has been provided by terrestrial laser scanning on the remains of a gord settlement in the Pomeranian village of Stary Kraków, where faint traces of ploughing were detected within the village square. The researchers suggested that, despite some discrepancies, they may have arisen through the use of the 'ridge and furrow' ploughing technique known from other regions of Europe (Banaszek 2013, p. 338). Meanwhile, aerial laser scanning (ALS) allowed this tillage method to be identified in the vicinity of Miłomłyn (Solecki 2018). It should be added, however, that strip tillage was more used on loamy soils, which are often wet, because it ensured effective drainage into furrows, increasing yields in the wet period, whereas in times of drought plants grew better if planted in the furrows (Andersen *et al.* 2014, p. 5). I do not know if such conditions prevailed in the sites in question, but the theses put forward by researchers are extremely inspiring.

It also seems important that research (whether invasive or not) should cover a larger settlement area. So far, the interest of researchers (which is usually effectively restricted by historical preservation services or an investor) has only been directed towards areas covered by historical buildings. No studies have covered urban or rural land stock. Attempts to define their size and identify possible differences between, let us call it, a 'suburban zone' and a typical rural settlement.

The subject of boundary markers is little discussed. Beginning with an article by Ryszard Kiersnowski (1960), we can mention only a few works by archaeologists, most often concerning Silesia (Śląsk) (Buśko 1991). The literature on this topic is dominated by historians and geographers.

There is also a lack of research on water management. Even in the case of such readily and frequently researched defences surrounded by water obstacles, no detailed analyses have been conducted as to what moats or ponds or their water supply systems looked like. The use of ponds as fisheries has not been researched and little attention has been paid to mills. I mean not only the study of their remains, of which not too many have been discovered (Bender 1974; Bagniewski, Kubów 1977; Długołęcki, Kuczyński, Długołęcka 2004), but primarily of the changes that human activity brought to the hydrological system. Therefore, geographers are more often interested in these changes (Kaniecki, Brychcy 2010).

Since the 1980 publication of the book (written by an archaeologist) that was first to use both archaeological and historical sources to analyse settlement very broadly (in this case, in the Łęczyca region), the use of historical records has become a standard in our research (Kajzer 1980). These activities are now much easier, which is due to the successive volumes of the historical and geographical dictionary of Polish Lands in the Middle Ages. Unfortunately, their content varies considerably by editorial team, and the selection of cited data can vary. However, it is a good starting point, though it does not exempt us from further desk research.

Here I would like to return to surface research, which, if conducted in the traditional way, will only slightly enrich our knowledge about late medieval

settlement. During such investigations, we record everything, without intentionally searching for particular signs that only when combined with one another may bring something new. In the field, one should look for relics of settlement features whose existence has been confirmed in the historical records. Only then do we have a chance to correctly interpret the traces we have discovered. In the vicinity of a knight's manor, an economic base or a sizeable village must have existed. Likewise, in the immediate vicinity of a church, one can expect at least a few settlements and a cemetery. While city-castle complexes are often studied, we have only modest information on the existence (or lack) of a certain model of spatial relations between the manor house, the village and the church, or between the manor house and the city. Of course, research can only be conducted at selected sites and they will tend to be case studies, but without it we will not obtain the amount of data we need to develop settlement models for the late Middle Ages.

One excellent example of such activities is of course Zwanowo/Dzwonowo. However, we realise that this is a completely unique discovery – an abandoned settlement complex, at which site no new buildings have been built. We cannot expect too many such discoveries, and an archaeologist usually has to conduct his research in far less comfortable conditions. S. Kurnatowski once wrote that archaeology was 'fairly labour-intensive' (Kurnatowski 1978, p. 172), and, as we all know, this is an extremely accurate observation. However, modern search methods, such as the extremely popular airborne laser scanning (whose potential is summarised in the 11th volume of 'Archaeologica Hereditas' (*Lotnicze skanowanie* 2018), but also all non-invasive surface methods of geophysical and scanning research make our task much easier. With the right selection of methods – traditional surface exploration and excavation along with non-invasive research – it will be possible to study a large area using fewer resources than traditional excavations required, especially since preliminary findings made after non-invasive prospection allow the locations of sites for excavation or the collection of environmental or dating samples to be precisely defined.

The popularity of non-invasive methods and the clear preference for them among preservation services have led to the opinion that archaeologists might soon forget what a shovel looks like. The number of projects proposing only non-invasive research that are submitted as applications to various funding initiatives is huge, but the question remains – how are we going to date such sites? I hope that we will not only be left to a traditional determination of the relative chronology of potsherd finds. Sampling for laboratory tests requires excavation research. Additionally, the relatively rare occurrence of organic materials suitable for ^{14}C testing, and of wood for dendrochronology especially, means that a small survey is usually not enough (Marciniak-Kajzer 2018a; 2018b). Even the most modern technique of thermoluminescence dating can be used to analyse ceramics taken

from the surface but gives incomparably better results when we collect several samples from a recognised stratigraphic system (Ginter, Marciniak-Kajzer 2017).

Another issue is the acquisition of movable cultural artefacts that allow the study of material culture, and which we will not find in large quantities without excavations.

In this text, I have tried to outline problems that in the archaeology of the late Middle Ages have thus far rarely been discussed, usually because large-scale studies cannot be conducted for a variety of reasons. There has been no money for them, no awareness of the need for such research on the part of the historical preservation services, and no special interest among researchers themselves because, with technical possibilities more much limited than they are today, such research would have taken years and risked yielding less than spectacular results. In the current situation, using a wide range of research methods, we have the opportunity to significantly intensify settlement research, which will in the future significantly improve our knowledge of the medieval cultural landscape.

And one final remark – the publications cited in the text are only examples, and the listing of at least the majority of the works on the discussed research has resulted in the article's extensive bibliography.

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