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PROFESSOR TADEUSZ POKLEWSKI-KOZIEŁŁ AND THE RESEARCH ON THE DEVELOPMENT OF THE AGRICULTURE TECHNOLOGY IN MEDIEVAL AND MODERN POLAND

Abstract: One of the specializations at the Łódź Center of the Institute of Archaeology and Ethnology PAS is research on agricultural techniques in Middle Ages and in modern times. The research was initiated in the sixties of the 20th c. by Professor Tadeusz Poklewski by excavations in the region of Spycymierz, in central Poland. During the excavations he discovered traces of plowing with a moldboard plow dated to the 8th-10th c. Furthermore, on the basis of pottery scattering, he demarcated fields measuring around 5 ha each. The pottery found its way to the fields together with the compost, with which the fields were fertilized. It helped to determine the chronology of 7 fields to the 10th-12th c. and of 8 other ones to the 12th-14th c.

In later years Professor did not lead any excavations of his own, which would relate to research on the history of agriculture, but he showed interest in such excavations, helped interpreting them. The archaeological material was analyzed under his guidance.

On the route of the future highway, in Piaski-Nowa Wieś near Łowicz, Piotr Strzyż discovered 5 ditches, all parallel to each other. It was Professor Poklewski, who pointed to their similarity with the discoveries of Władysław Filipowiak in Dobropole, Pomerania, and helped this way to interpret them as traces of plowing with a one-sided moldboard plow.

Also on the route of another future highway, in Pomorzany near Kutno, the expedition of the Łódź Center examined the remains of a grange, which functioned there from the 14th c., geared towards animal husbandry. In the beginning of the 19th c. the grange was relocated and in its place arable fields were established. The analysis of grange excavations was prepared and published under the editorship of Professor T. Poklewski.

Research on agricultural techniques carried out by Professor T. Poklewski at the Łódź Center of IAE PAS allow to learn and understand not only the development of technology, the discoveries and inventions, but also the work of an ordinary man – the producer.

Keywords: Professor Tadeusz Poklewski-Koziełł, agriculture technology, medieval Poland, modern Poland

The specialization of the Institute of Archaeology and Ethnology of the Polish Academy of Sciences, Centre in Łódź, well expressed by its name, is by no means accidental. Research in, widely understood, technology of production began already at the times of the organizational predecessor of the Institute – the Management for the Studies on the Beginnings of the Polish State – in the years 1948-1953.

The precursor of this research path was Andrzej Zbierski: by examining the finds from excavations of a stronghold in Tum, near Łęczyca, he started to study the early medieval coal mining and metallurgy. Basically, during the entire time of the Center's activity its researchers studied the questions of the history of construction techniques. In the beginning the focus was mainly, although not exclusively, on wood constructions and the interest sprouted with the excavations of the stronghold and the collegiate

church in Tum. In contrast, from the beginning of the 70ies of the 20th c. the essential emphasis was put on research in stone and brick architecture of castles and cities, as well as on the history of ancient weapons and textile production¹.

Another issue, among research topics of the Centre, were studies of the agricultural techniques in medieval times and in the modern age. This area of studies was represented, in the first place, by Professor Tadeusz Poklewski, to whom we dedicate this volume of „Fasciculi Archaeologiae Historicae”, but also by other co-workers of the Centre. Yet Professor T. Poklewski showed interest each time when new excavations were carried out, helped with their interpretation and it was under his supervision that the finds were scientifically expertized.

¹ Maik 2013.

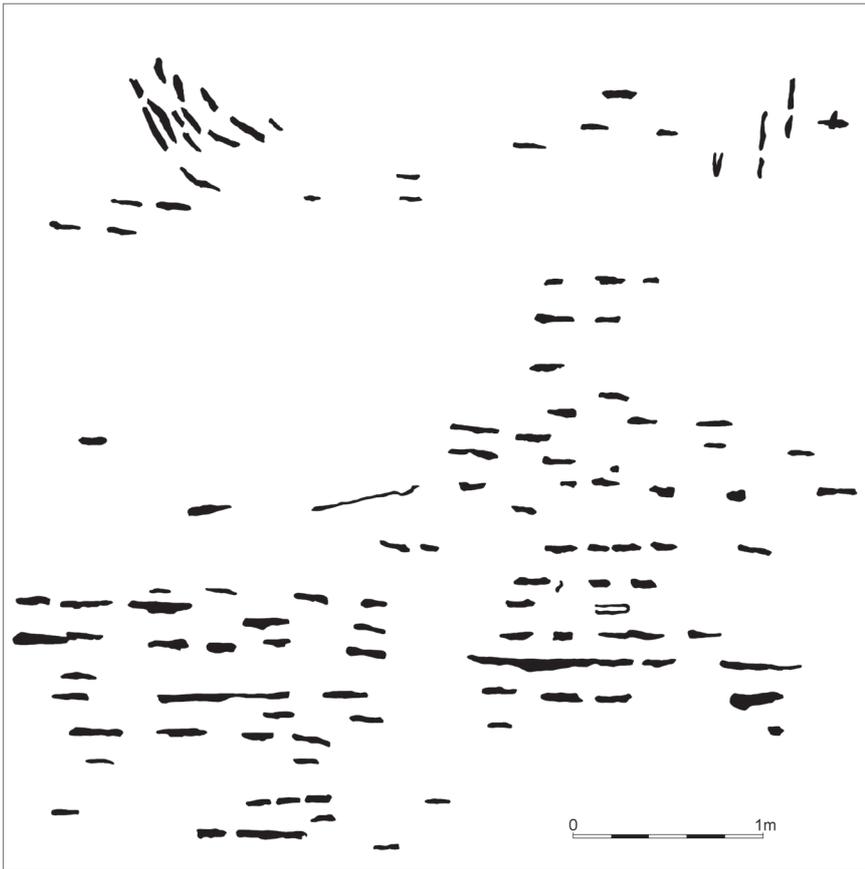


Fig. 1. Traces of plowing at „Dębowe Górki”. After T. Poklewski 1975. Computer processing by E. Wtorkiewicz-Marosik.

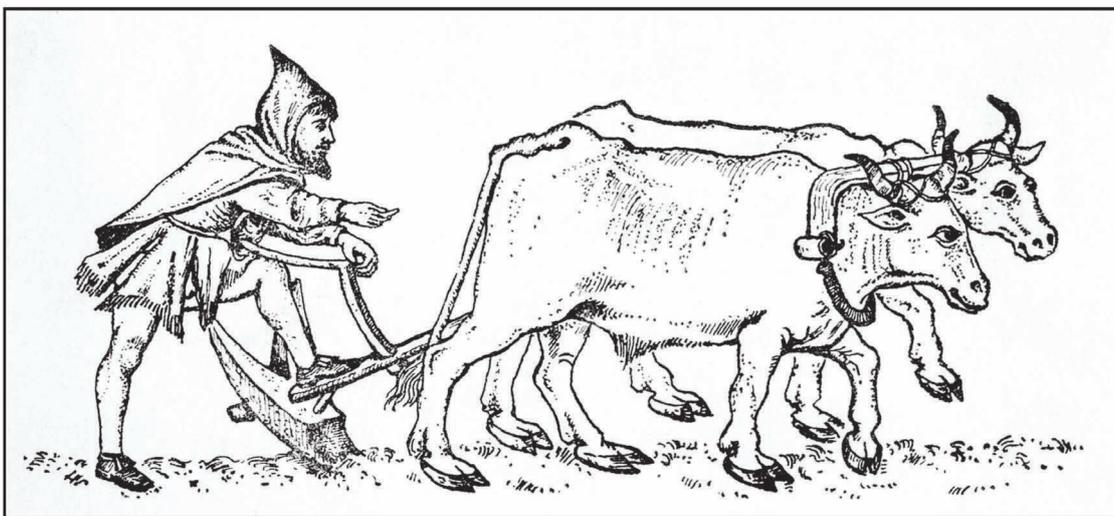


Fig. 2. Plowing with a wooden plow. Redrawn from a Florence medieval miniature. After T. Poklewski 1975. Computer processing by E. Wtorkiewicz-Marosik.

In 1962, after accomplishing the millenary studies, the Department for Archaeology of Central Poland of the Institute for the History of Material Culture PAS began excavations at the castellany in Spicymierz and continued them until 1972. This was a big, team-engaging, scientific undertaking, eventually finalized by T. Poklewski. He is also the author of the work titled *Spicymierska włość grodowa w średniowieczu. Obraz gospodarczy (Spicymierz Castellany demesne in Middle Ages. An economic picture)*,

in which he summed up the research results².

At the beginning of the 12th c. the Spicymierz Castellany was an important administrative and economic agency, with a center in Spicymierz. It is mentioned in Gall Anonym's *Chronicles* as well as in the Bull of Gniezno³. Its importance decreased, though, relatively soon and the administrative-economic center was moved to the neighboring Uniejów, which belonged to the archbishops of Gniezno⁴.

² Poklewski 1975. Further bibliography there.

³ Poklewski 1975, 17.

⁴ Poklewski 1975, 12-13.

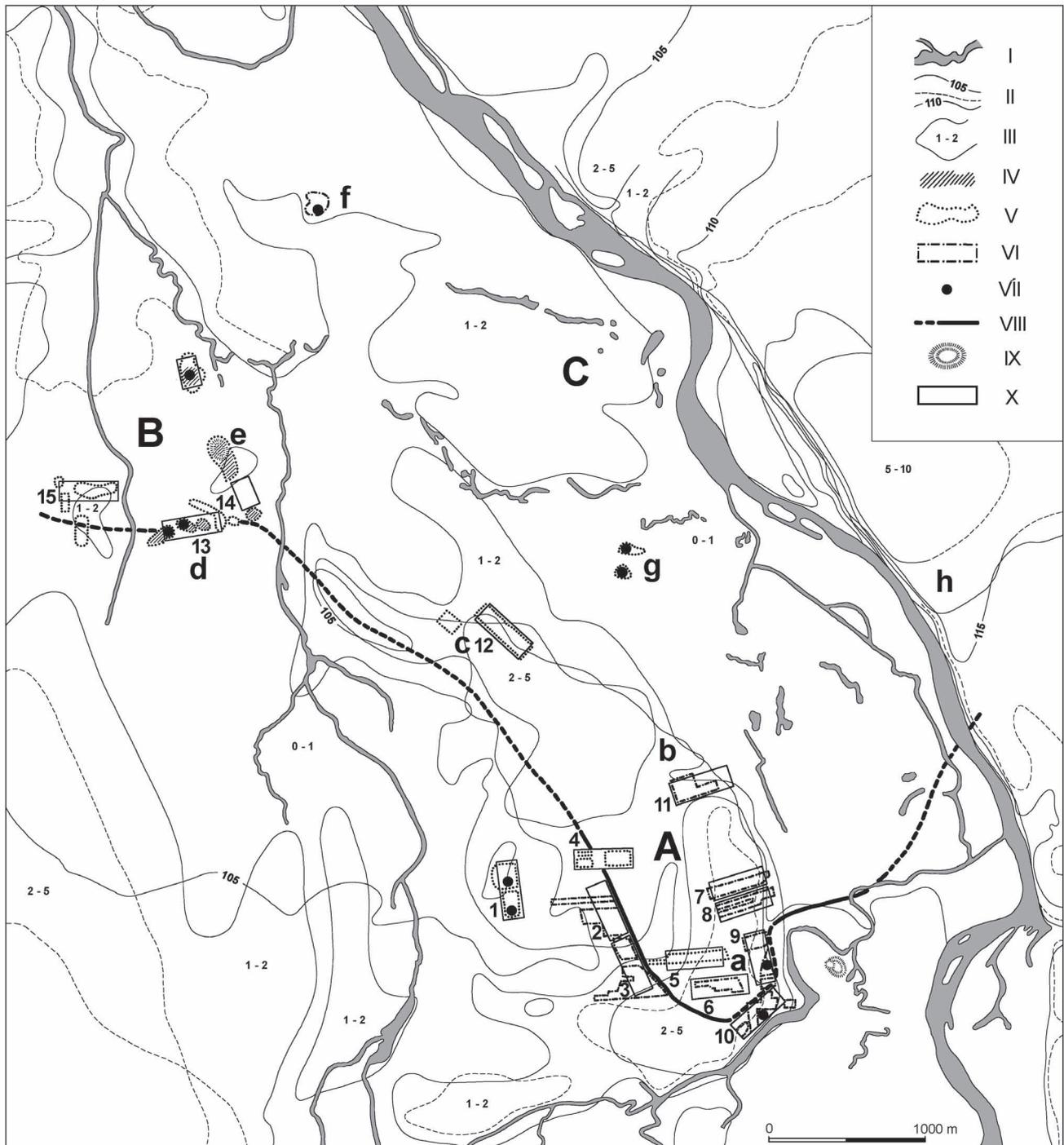


Fig. 3. Medieval farming around Spicymierz. I – water; II – hypsometric layers; III – dry layer, tillage from 8th-9th c., tillage from 10th-12th c.; IV – tillage from 8th-9th c., V – tillage from 10th-12th c.; VI – tillage from 12th-14th c.; VII – dwelling places; VIII – the road: hypothetical and confirmed; IX – strongholds; X – field module 5 ha; A, B, C – zones of settlement exploitation; a – Spicymierz; b – Zieleń; c – Człopy; d – „Dębowe Górki”; e – „Smulska Góra”; f – Wieścice; g – Łęg Kościeliski; h – Uniejów. After T. Poklewski 1975. Computer processing by E. Wtorkiewicz-Marosik.

The archaeological excavations got underway in the stronghold of Spicymierz and on the adjacent territory, where the medieval settlements existed. The works included later also the archaeological sites discovered on the area of village Wieścice: the stronghold in Ewinów, called the „Mountain of Smulsko” („Smulska Góra”), and the sites discovered on the meadow aits around villages Ewinów and Boleszczyn, called „Little Oak Hills” („Dębowe Górki”). Field works ended in 1972 with a geophysical survey carried

out on a large scale. The archaeological excavations were accompanied by an analysis of written sources and hydrological and pedological investigations⁵.

During the excavations on „Little Oak Hills”, about 60 cm below the present surface, small cavities filled with humus were found – some of them having the form of a longish spot with one longer side which was clearly

⁵ Poklewski 1975, 12-16.

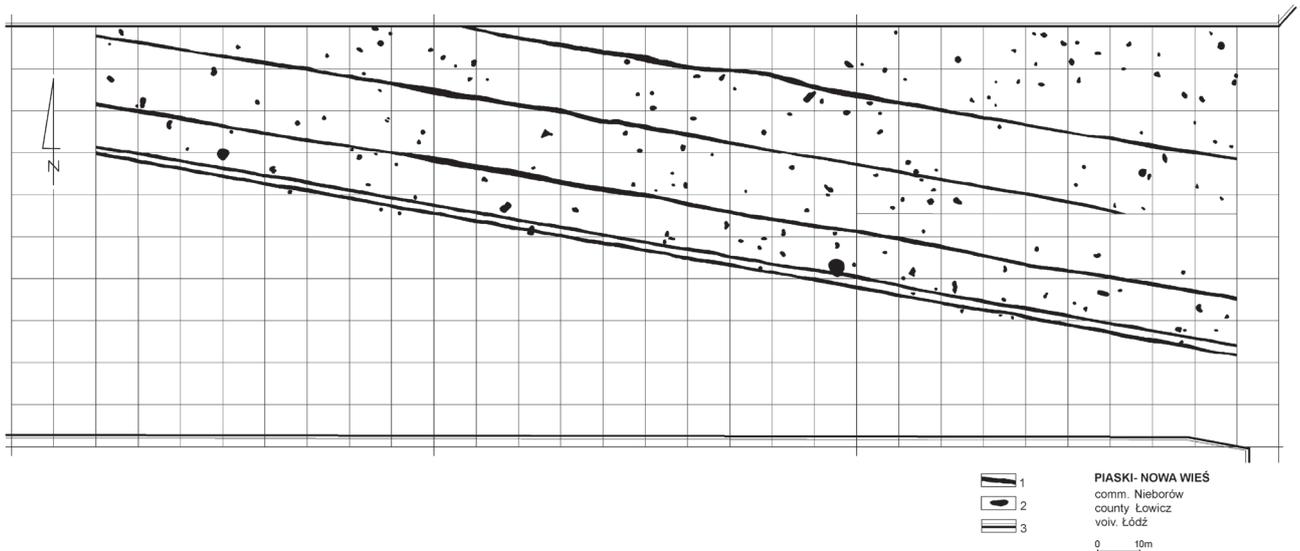


Fig. 4. Remains of arable land in Piaski-Nowa Wieś. 1 – ditches; 2 – archaeological features of Hallstatt culture; 3 – borders of the highway A2. After P. Strzyż (ed.) 2009. Computer processing by E. Wtorkiewicz-Marosik.

cut off, while other ones had the form of an elongated drop of water. The cavities were arranged in strips, one after another, and had always one edge cut off on the same side or an elongated, same side of the water drop. The strips formed bundles with spacings of around 15-centimeters. One of the bundles turned back at the end.

The discovered cavities could have resembled a record of digging with a shovel or a spade, if not for their regularity and, above all, the traces of turning back. Therefore the cavities were interpreted as traces of plowing, performed with a wooden plow, symmetrically formed (hence the form of the water drop), with a one-sided moldboard. It was moved by animal traction. It seems that the plowing was rather even, although shallow, while the tool itself had a fair efficiency for that time⁶. What did plowing with this kind of plow look like may be observed on a medieval miniature of a manuscript from Florence, a picture which T. Poklewski placed in his book⁷.

It should be emphasized that while traces of one bundle turned back at one point – the traces of another bundle ran further in the same direction. Therefore, we can assume that we deal with two ridges of unequal length. The remains of plowing were registered on the examined ait in three places – on its culmination and twice on its edge – which speaks for the fact that plowed was its entire area.

Moreover, on the surface of the aits on the „Little Oak Hills” fragments of clay pottery could be observed: not only at places where the cultural layer (developed due to the existent settlement) was discovered, but also at places where no traces of settlement could be stated and arable land was found instead. Interesting was also the fact that at places where cultural layer occurred, bigger and better preserved pottery fragments could be found more often, whereas

pottery found on the arable land was more destroyed and in smaller pieces.

How could this pottery find its way to the fields? In the opinion of T. Poklewski it came from the household rubbish pits, the content of which was transported to the fields and strewn around as compost. This opinion seems to be strongly justified⁸.

A hypothesis was accepted that the occurrence of small pottery fragments designates the area taken in Middle Ages by arable land. On this basis an attempt was made to identify the entire area of medieval arable lands within the Spicymierz demesne. Analyzed were the hydrographic and soil conditions and against this background 3 zones for geophysical surveys were assigned. Pottery collected during the surveys was registered on maps and according to this information 15 fields (measuring around 400x120 m, i.e. 5 hectares each) were designated. This means that in the Spicymierz demesne plowed was around 10 % of the area suitable for tillage⁹.

Pottery found in the fields underwent formal and typological examination. In effect it could be stated that 7 fields were managed during the time between the middle of the 10th and the 12th c. Among these: 3 fields were on „Little Oak Hills” and 4 other fields in direct vicinity of Spicymierz – its village and stronghold – while the whole arable area amounted at that time to about 35 ha. The other part – 8 fields located in the region of Spicymierz – is dated to the time between 12th and 14th c. Cultivated then were around 40 hectares of arable land¹⁰.

We must explain here that the analysis of the layer stratigraphy of trenches on the „Little Oak Hills” (where the traces of plowing were found) and the analysis of the pottery found in the trenches showed that the plowing should

⁶ Topolski 1964,126-130; Baranowski 1978, 83-84.

⁷ Poklewski 1975, cover.

⁸ Poklewski 1975, 42-45.

⁹ Poklewski 1975, 51.

¹⁰ Poklewski 1975, 53.

be dated to earlier times – between 8th and 10th c. – and the entire arable land could amount to 10 hectares¹¹.

Unfortunately the results of the archaeological research were not confirmed by the biological examinations – it turned out that the implemented method of determining the phosphate concentration level was not exact enough.

The examinations of fields in Spicymierz region allowed to determine the fundamentals of economy for this important, in the Middle Ages, stronghold demesne. They were absolutely precursory in Polish science.

Another example of discovering the remains of former arable land was delivered by examinations led by Piotr Strzyż on Site 4 in Piaski-Nowa Wieś, Łowicz country. The examinations were carried out as a part of archaeological rescue excavations, related to the construction of highway A2. In the past this area was occupied by a Pomeranian culture settlement of the Hallstatt period. Nevertheless, among settlement remnants of this culture, mainly all kinds of pits and hearths, 5 longish darker spots were observed: parallel to each other and crossing the entire length of the examined trench, i. e. having from 185 to 274 m length. Their width differed in different sections and amounted from 40 to 220 cm, whereas the depth varied from 25 to 50 cm. They reminded therefore of shallow ditches, in cross-section close to a rectangle with a fairly flat bottom – and this is what they were called at first¹².

Discovered in their infill were sparse pottery fragments, in majority modern ones, but also pre-historical, which found their way there probably secondarily, due to the soil shift.

The interpretation of those „ditches” could have been difficult, if not for the earlier discoveries, which Władysław Filipowiak from Szczecin made in the village Dobropole near Kamień Pomorski. Professor T. Poklewski drew the attention of other scientists to these discoveries. W. Filipowiak found in Dobropole the remains of the so called long ridges, which are visible today on the field and are known from the late medieval sources as „die langen Stücke”¹³. They could be seen on the surface as two parallel rows of shallow ditches and little mounds in turn. Their length amounted from several dozens to 300-400 m, in some cases they could even be 600 m long, while the spaces between the ditches and mounds measured in the majority around 15 m¹⁴. The fields consisted mostly of several ridges but the largest one – Field No I – counted as many as 65 ridges; it also preserved visible traces of plowing in form of longish streaks¹⁵.

The ridges gain this kind of look after plowing with an asymmetrical moldboard plow. A peasant begins to plow by the bulk which divides the ridges. The plow moves along the bulk till the end of the ridge, then it turns back and the plowing continues along the opposite bulk. After the following turn the plowing continues closer to the middle of the ridge and the next time still closer. This way the soil is always thrown to the inside of the ridge. Due to the many years of field cultivation bulks, in form of low mounds, are created on the edges of the ridge, while in the middle of it longish immersions, in form of shallow ditches, emerge. Exactly this way of plowing Pieter Breugel the Older showed in his famous picture „Death of Icarus”¹⁶.

Intensive agriculture practiced until now in Piaski-Nowa Wieś, near Łowicz, resulted in leveling the bulks, which divided the ridges, and in filling in the ditches – i. e. in evening of the entire field area. The lack of possibility to enlarge the research area and exceed the territory of the future highway resulted in the fact that neither the size of a single ridge, nor – even less – of the entire field could be estimated. Still, essential was the detection of plowing with an asymmetrical moldboard plow, which in medieval times was a very modern tool and continued to be used in Central Europe as late as 19th c.¹⁷. In Dobropole, Western Pomerania, this kind of plow was in use in 15th c. Could we date the ridges in Piaski-Nowa Wieś similarly? This we do not know, but it seems that using this kind of plow in Central Poland could start in 16th or 17th c. and the discoveries in Piaski-Nowa Wieś could originate in this period (the pottery found in the filling of the ditches points to this fact)¹⁸.

Also the third example of research on technology of agriculture executed by IAE PAS Centre in Łódź is a result of archaeological rescue excavations performed on highways. We are speaking this time of two neighboring archaeological sites – Pomorzany in Kutno county and Pomorzanki in Gostynin county, both on the highway route A1. Archaeological excavations were conducted there for 3 years by a large team with changing members – all co-workers of the Center – and directed at first by Witold Świątosławski, and later by Wojciech Dudak and Radosław Herman. The results of the examinations were elaborated by the team managed by Professor Tadeusz Poklewski¹⁹.

Discovered in Pomorzany were the remains of a gentry grange, which functioned from the 14th until the beginning of 19th c., whereas in Pomorzanki – a place detached from Pomorzany by River Skrwa – the remains of a cone-shaped stronghold from the 14th c.: a remnant of a watchtower built on the mound, surrounded by a moat, and a village dated to the time between 14th and the beginning of 19th c.

¹¹ Poklewski 1975, 54.

¹² Strzyż (ed.) 2009.

¹³ Filipowiak 1972.

¹⁴ Filipowiak 1972, 173-176.

¹⁵ Filipowiak 1972, 180, Fig. 9.

¹⁶ Pataky and Marjai 1977, 16.

¹⁷ Topolski 1964, 126-130; Baranowski 1978, 83-84.

¹⁸ Baranowski 1978, 83-84.

¹⁹ Poklewski-Kozieliński (ed.) 2013.



Fig. 5. Tillage with a one-sided moldboard plow in the painting of Pieter Bruegel the Elder. After Pataky and Marjai 1977. Computer processing by E. Wtorkiewicz-Marosik.

In this paper I will discuss the changes taking place on the farm discovered in Pomorzany. Not much has been left from its oldest – dated to the 14th century – phase: a few hearths and pits, which were possibly the remains of wooden buildings, constructed maybe as log frame structures. What remained after pulling such buildings down were meager traces and three wells. One of them is more of a water intake – in form of a barrel dug into the ground around 1350 – than a well. The second well, some 45 m away from the barrel, was built around 1420, but no remains have been found in its surroundings which would speak of its purpose and its significance for the farm. However, the third well was a very important feature on this grange. It was built in the 70ies of the 14th c. and was used until the 2nd half of the 18th c., many times mended, even by embedding a second, inner encasing. The dating of this mending is fixed in the results of dendrochronology, for which 41 wood samples were taken. The well is placed on a big, semi-square courtyard with sides measuring around 45 m, surrounded by outhouses and dwellings. Buildings surrounding the courtyard were dated to modern times – 14th to 18th c., although some older buildings possibly stood in their places formerly. We assume that buildings 4, 6 and 9 could have been dwellings, of which two – 4 and 9 were burned, maybe during the dissolution of the grange²⁰.

Other buildings were, with no doubt, outhouses. Perhaps they were stables, barns or sheepfolds, adjusted

for keeping and breeding a large number of animals. This is demonstrated even by their size: length from 20 to over 60 m and width from 10 to 15 m. We do not know, if they were just as durable farm features, as the courtyard or the well – it is possible that only a part of them functioned simultaneously²¹.

It is worth adding here, that farms similarly constructed are known from Mazovia, Great Poland, but also from Belarus and these analogies sustain our opinion on the breeding purpose of the discovered farm remains²². And so we examined in Pomorzany one of the three parts of a typical Polish nobility manor – its breeding part – but we lack the owner's dome with its pantry and the place where grains were kept, meaning the threshing floor. They are probably to be found somewhere outside of the land-strip covered by the highway, i.e. a place inaccessible for archaeologists up till now.

The stronghold, in form of the watchtower placed on a mound, possibly stopped existing in the beginning of the 16th c. and its remains buried the remnants of the oldest medieval village buildings. The village itself and the farm stopped functioning at the examined place in the beginning of the 19th c. The farm could have been relocated to the other side of the local road, placed somewhat to the north from the examined territory, where until today we find some slightly

²⁰ Maik 2013a.

²¹ Poklewski-Kozieł 2013a.

²² Jakimowicz 1994, 17-27; Nowacki 1994, 7-15; Rozbicka 1999; Poklewski-Kozieł 2013a, 53.

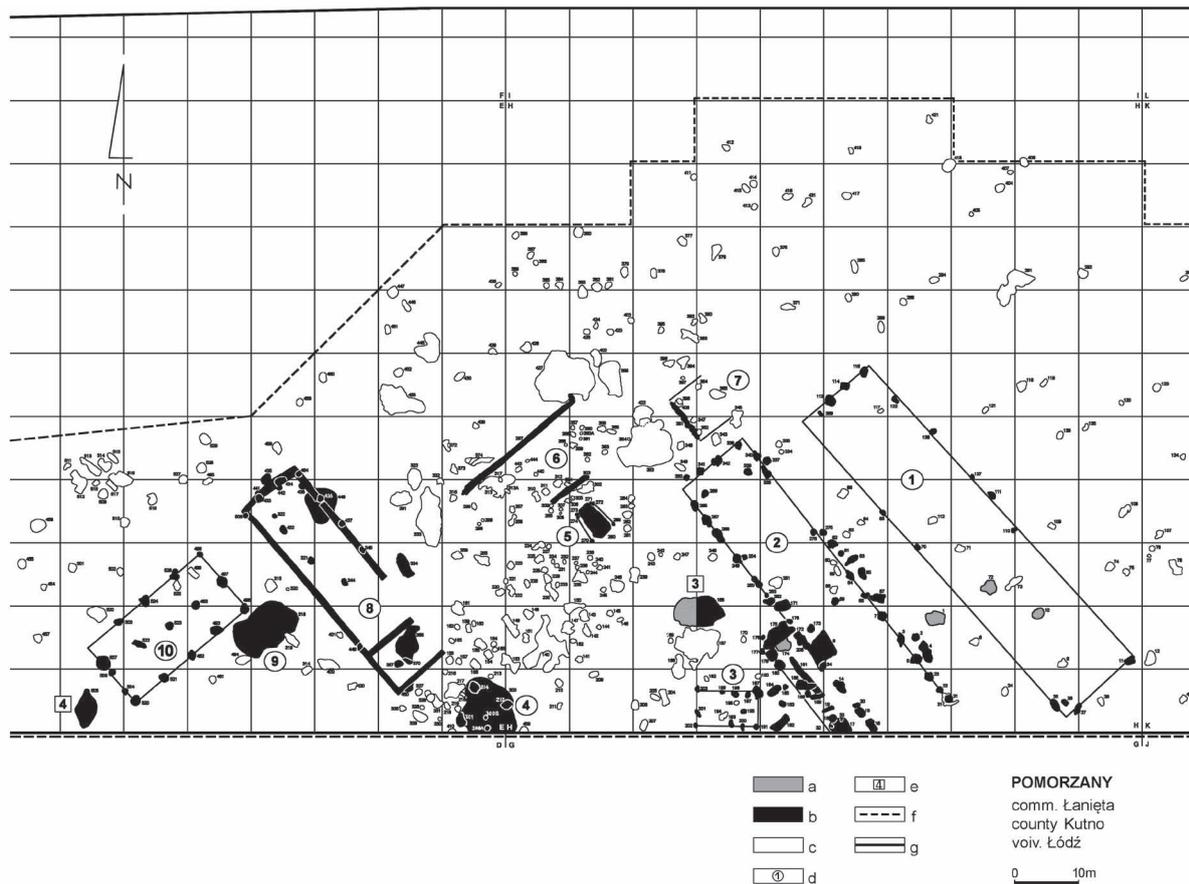


Fig. 6. Archaeological remains of a grange at Pomorzany: a – archaeological features: from the 2nd half of 14th c. to the 1st half of 16th c.; b – archaeological features from 16th-18th c.; c – undated archaeological features; d – buildings; e – wells; f – borders of the examined area; g – borders of the highway A1. After T. Poklewski (ed.) 2013. Computer processing by E. Wtorkiewicz-Marosik.

ruined farm buildings in stone, originating rather in the 20th than 19th c. We do not know where the village was relocated to – maybe to the territory of today's village Pomorzanki, or some other one.

But the area taken by the archaeologically examined farm, the tower on the mound and the village were adjusted to the needs of arable farming, i.e. flattened and covered with compost – we do not know where brought from. Many archaeological relics found their way to the examined area together with this compost. They do not fit by their character to the examined village or farm. E. g. many fragments of rich, tiled stoves were brought onto the area of the village. They can be the remains of a stove which functioned in a manor, or a palace, but not in a country hut²³.

At least 4 ha of the area was turned into arable land in this way. This means transporting and storing around 12 000 m³ of humus, waste, compost. In the beginning of the 19th c. this meant approximately 8 000 courses of one- or two-horse carts, i.e. an enormous effort, which demanded good organization skills. To this day the region of Pomorzany and Pomorzanki is dominated by arable land – of course outside of the area examined by the archaeologists: this is covered

by a comfortable highway leading from Łódź to Gdańsk.

These three examples demonstrate the changes, which the agriculture underwent in Middle Ages and in modern times. Replacing a primitive coulter with a one-sided mold-board plow was an unquestioned progress. In Pomerania this took place in the 15th c., possibly under the influence of the German settlement. In central Poland the change occurred later, in the 16th or even 17th c., but noticing such transformations seems to be important.

Interesting also is the reporting on the agricultural development in the region of Pomorzany and clear enlargement of the arable area at the expense of old farm buildings, which took place in the beginning of the 19th c.

Instead of wrapping-up I would like to remind that Professor Tadeusz Poklewski dedicated the book on Spicymierz demesne to his father, who taught him to understand the village and the farmer²⁴. By the same way we handle in the IAE PAS Center in Łódź all works on old technologies, which allow to learn and understand not only the development of technology and discoveries as well as inventions, but also the work of a simple man – the producer.

Translated by Beata Kita

²³ Poklewski-Kozieł 2013b, 83-87.

²⁴ Poklewski 1975, 8.

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Streszczenie

Profesor Tadeusz Poklewski-Kozieł i badania nad rozwojem technik rolnych w średniowiecznej i nowożytnej Polsce

Jedną ze specjalizacji łódzkiego ośrodka Instytutu Archeologii i Etnologii PAN są badania technik rolnych w średniowieczu i w czasach nowożytnych. Zapoczątkował je w latach 60. XX w. profesor Tadeusz Poklewski badaniami w rejonie Spicymierza w Polsce środkowej. Odkrył w wykopaliskach ślady orki radłem datowane na VIII-X w. Ponadto wytyczył na podstawie rozrzutu ceramiki pola o wielkości około 5 ha każde. Ceramika ta znalazła się na polach wraz z kompostem, którym były nawożone i określiła chronologię siedmiu pól na X-XII w. i osiem dalszych na XII-XIV w.

W późniejszych czasach profesor nie prowadził już własnych wykopalisk związanych z badaniem dziejów rolnictwa, jednak wykopaliskami się interesował, pomagał w ich interpretacji, pod jego kierunkiem opracowywano też materiały z badań.

Ekspedycja IAE PAN odkryła na trasie przyszłej autostrady w Piaskach-Nowej Wsi koło Łowicza pięć równoległych do siebie rowów. Na ich podobieństwo do odkryć W. Filipowiaka w Dobropolu na Pomorzu zwrócił uwagę profesor Poklewski i pomógł w ten sposób w ich zinterpretowaniu jako śladów orki pługiem z niesymetryczną odkładnicą.

Również na trasie przyszłej autostrady w Pomorzanach koło Kutna ekspedycja łódzkiego ośrodka zbadała pozostałości folwarku szlacheckiego funkcjonującego tam od XIV w., nastawionego na hodowlę zwierząt. Na początku XIX w. folwark przeniesiono, a na jego miejscu założono pola orne. Opracowanie badań folwarku zostało przygotowane pod redakcją profesora T. Poklewskiego.

Badania technik rolnych prowadzone przez T. Poklewskiego w łódzkim ośrodku IAE PAN pozwalają poznać i zrozumieć nie tylko rozwój technologii i odkrycia oraz wynalazki, ale też pracę zwykłego człowieka – wytwórcy.