

MEDIEVAL POPULATIONS OF THE MAZOVIAN-RUS' FRONTIER IN THE TIME OF CHRISTIANIZATION

PRELIMINARY RESULTS OF ARCHAEOLOGICAL AND GENETIC ANALYSES

The basins of the middle Bug and upper Narew rivers, situated on the modern Polish-Belarusian border (fig. 1), have constituted a permanent ethno-cultural, linguistic, and religious frontier for about one thousand years. The aim of the pilot project »The beginnings of Christianity on the Mazovian-Rus' frontier«, the results of which are presented below, was to recognize – through the analysis of inhumation burials – the socio-cultural and palaeobiological features of populations which can be defined as comprising the oldest formally-converted Christians in the region. They appeared c. 1000 AD at the earliest, and for 250 years they functioned in the context of diversified forms of pagan rituals based on cremation burials (Kalaga 2019; Skrzyńska 2019b).

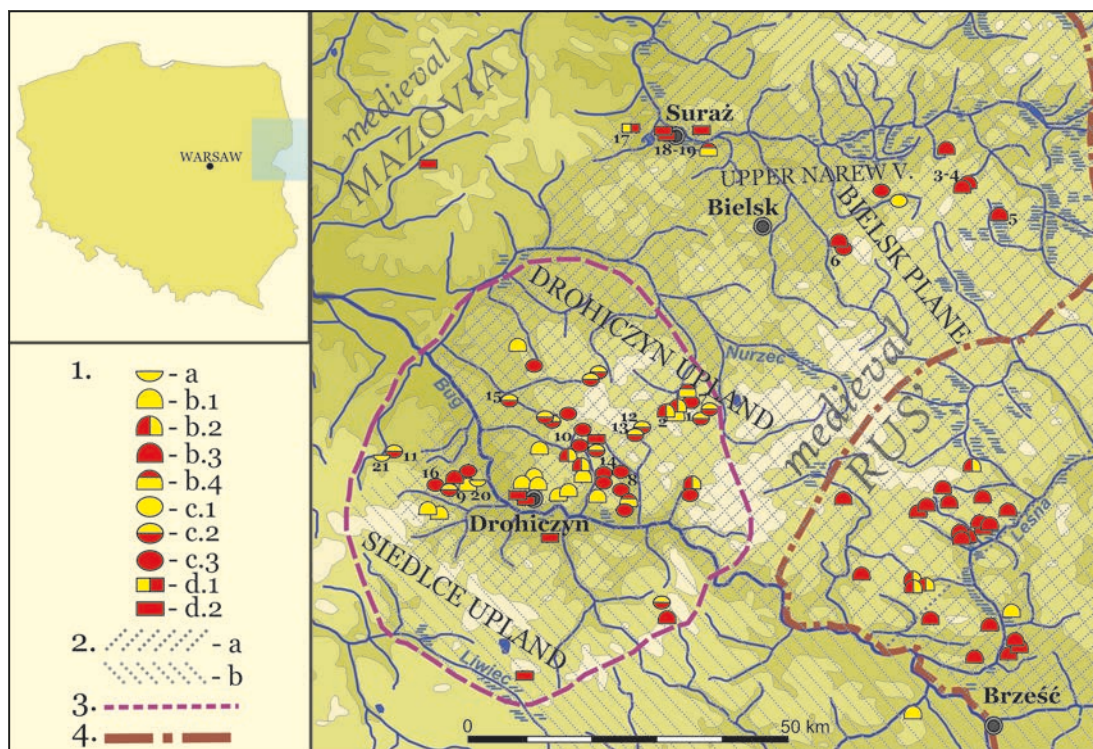


Fig. 1 The localization of upper Narew and middle Bug basins in the context of the present Polish territory. – **1** main types of medieval cemeteries (10th-13th centuries): flat pit graves with cremation (**a**); barrows (**b**) with: cremation burials (**b.1**), biritual (**b.2**), inhumation burials (**b.3**); primarily cremation – secondary inhumation burials (**b.4**); necropolises with stone-kerbed graves (**c**): cremation burials (**c.1**), biritual (**c.2**), inhumation burials (**c.3**); graveyards with flat graves (**d**): biritual (**d.1**), inhumation burials (**d.2**). – **2** the spatial range of barrows (according to Skrzyńska 2014): with stone constructions (**a**), without stone constructions (**b**). – **3** the spatial range of occurrence of pots of »Drohiczyn Type« (according to Wojcik 2013, compilation of figs 50-51. 86). – **4** modern Polish-Belarusian border. Numbers of sites sampled for palaeogenetic research correspond to the list in **tab. 1** (no. 2: the sample comes from the secondary skeleton burial; nos 5 and 16 not labelled: reference samples of late medieval and early modern chronology). – (Illustration K. Skrzyńska).

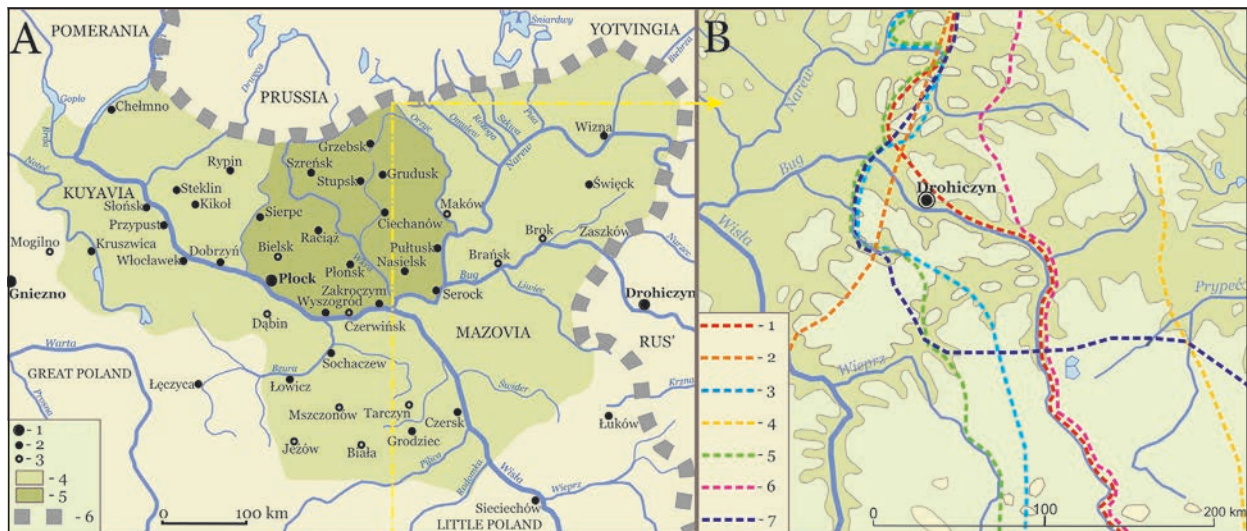


Fig. 2 Map of medieval Mazovia. – **A** territorial extent in the 11th-12th centuries (according to Gieysztor 2006, 120) with additions according to the author's description (Gieysztor 2006, 119-121); **1** capitals of districts and duchies; **2** major strongholds; **3** other places; **4** Mazovian territory in the second half of the 12th century; **5** the core of the domain called »Old Mazovia« (»Stare Mazowsze«); **6** frontier of the Polish State. – **B** reconstructions of the Mazovian section of the Polish-Rus' border during late 10th-11th centuries; **1** according to Rybakov 1983; **2** according to Strzelczyk 1994; **3** according to Strzelczyk 1999; **4** according to Tyszkiewicz 1974; **5** according to Łowmiański 1973; **6** according to Nasonov 1951; **7** according to Mocja 2001. – (Computer processing by K. Skrzyńska).

HISTORICAL AND ARCHAEOLOGICAL BACKGROUND

The chronological framework for the research clusters around two cultural episodes, which took place more or less simultaneously in the Piast and Rus' states. The first was the territorial development on both sides, resulted in the incorporation of the middle Bug and upper Narew basins. Based on available historical and archaeological sources, it may be established that this process took place between the second half of the 10th and the first half of the 11th century when the investigated territory was (most probably) separated officially into Polish and Rus' parts (Pacuski 2019). Then, a lengthy, more or less stable borderline started to form, dividing the territory into two parts: the western (Piast Mazovia) and eastern (firstly Kievan, secondly Turovian and Wolhynian) princedoms. The lands between the middle Vistula, lower Narew, Skrwa, and Orzyc rivers, which were politically subordinated by the state of Mieszko I during the second half of the 10th century, were the core of the emerging Mazovian territory (Gieysztor 2006, 119-121; Dulnicz 1993). Its range and administrative and economic organization are indirectly reflected in the document defining grants for the Benedictine Abbey in Mogilno (woj. kujawsko-pomorskie/PL) drawn up in the mid-12th century but, as it is believed, illustrative for the situation from the third quarter of the 11th century (Kurbisówna 1968; Gaczyński 1983). The rest of the territory were *pertinentia* of this domain (fig. 2, A) and remained at a different level of territorial integration. Their eastern part was formed by lands in the middle Bug and upper Narew basins (Jaskanis 2008, 17-25). The local section of the Polish-Rus' border began to stabilize not until the second half of the 13th century. Hence, for the earlier phase, its course can be reconstructed only on the basis of indirect data, which is rather ambiguous. Such a level of knowledge is reflected in the absence of unanimity in historical reconstructions (fig. 2, B).

At the same time (i. e., in the second half of the 10th century), both states were officially converted to Christianity (for Poland cf. Buko 2016; Strzelczyk 2001; for Rus' cf. Petrukhin/Pushkina 1999; Shepard 2007; Tolochko 2011). Catholic and Orthodox missions thus supported the economic and political organization of these newly-incorporated territories. The presence of Christians (for the most part, only formally baptized) is

archaeologically confirmed by inhumation graves, with the oldest burials plausibly dated to the turn of the 10th and 11th centuries, and certainly to the first half of the 11th century (Olczak/Krasnodębski/Bieńkowska 2019; Skrzyńska 2019b). The religious conversion continued until the second half of the 13th century when the old, indigenous Slavonic culture declined, and local territorial communities continued under new cultural conditions until the late medieval period. The ideological development of local societies probably ended no sooner than in the 15th century, when a regular parochial network of religious establishments of both confessions was established in the region (cf. Jaszczolt 2005). All the main features of the ethno-cultural frontier are present, with domestic (pagan) and foreign (Catholic/Orthodox) patterns both visible (and intertwined) in archaeological evidence from cemeteries dated to the period of conversion – between (at least) the first half of the 11th century and the second half of the 13th century (and later). Archaeological evidence allowing for the basic differentiation of regional funeral rites from the 11th to 13th centuries indicate cremation and inhumation forms of burials. The former one is a basic feature for pagan funeral traditions that gradually had been disappearing during the 12th and 13th centuries (Kalaga 2006; Dzik 2015). On the other hand, the skeletal form of burial commonly cultivated on large cemeteries reflects Christian influences becoming the main distinguishing feature of the new ideology spread in a broad social context (cf. Labudda 1983; Gilchrist 2014).

In the western part of the region recognized for the pre-Christian times as the edge of the »non-burial zone« (cf. Zoll-Adamikowa 1979, 221), the beginnings of a new burial practice were associated with the sudden appearance of inhumation necropolises with flat graves and graves in stone settings (cf. Kordala 2006). The first type was predominant for proto-urban centres while the other was related to rural settlements. Both forms appeared also in the eastern part of the region, where the traditional and dominant form of graves specific for eastern Slavonic settlers were barrows. At the time of the reception of Christianity, they were accepted by the Orthodox Church as an alternative model of the burial custom. In rural communities, they survived even until the 16th century when the barrow burials became strictly forbidden (Petrov 2005; Sobolev 2012). Thus, the main distinguishing feature allowing for archaeological identification of Orthodox Christians in the region are inhumation barrows (Zoll-Adamikowa 1971, 552; 1979, 233).

Other types of cemeteries do not provide such a possibility, so we do not know whether the buried community was Catholic or Orthodox (cf. Buko 2019a). The presence of devotional artefacts of eastern provenance also does not entitle us to such interpretations because it is not certain whether their primacy was connected to the symbolic demonstration of the Orthodox faith. In the earliest phase of Christianization, their presence has been frequently interpreted as confirming a new confession. However, being often a part of collars made of pagan amulets (animal teeth, lunulas – cf. Koperkiewicz/Krasnodębski 2001; Koperkiewicz 2002; 2011), they could be treated as aesthetically attractive, but only ordinary ornaments without symbolic value. Taking into consideration the geopolitical situation of the region, it seems obvious that in the eastern part of the territory the oldest missionary activities were conducted by the Orthodox Church supported by the political power of Kievan Rus'. In the western part, Catholic missions played the same role in analogical circumstances. The distinction between the two confessions was perhaps known to the elite members living in proto-urban centres. But both in Catholic Poland and in Orthodox Rus', people were buried similarly (e. g. Płock [woj. mazowieckie/PL]: Gołębniak 2002; Kiev [Ukraine]: Ivakin 2011). It is not known, however, whether such awareness functioned in rural communities. If so, there are no traces of this in archaeological sources, except for the barrows.

Archaeological excavations in cemeteries on the medieval Polish-Rus' frontier are comparatively well developed in Poland. The topic has been studied since the third quarter of the 19th century when the first excavations in the region began¹. As a result of ongoing fieldwork and historical queries, around 440 cemeteries have hitherto been recognized by archaeologists in the part of the former Polish territory. From

this repertory, 73 sites were chosen as representative of the reconstruction of populations with pagan patterns of funerary rites alongside features of more progressive burial customs, which became apparent as an effect of religious conversion and the consolidation of Christianity in the regional and cultural landscape (Krasnodębski/Skrzyńska 2019).

Pagan traditions

It was not inhumation, however, but cremation that was the main feature of traditional funerary rites associated with Slavonic territorial settlement, expanding from Wolhynia and taking root in the region from the second half of the 6th century (Kalaga 2006). The oldest forms of graves were round- or rectangular-shaped pits in which cremated bones were deposited, and which were then filled up using clear sand or ashes from the cremation pyre. These graves were poorly furnished, predominantly only with fragments of clay pots. Such finds used to be interpreted as the remnants of urns or grave goods, intentionally destroyed before being placed in the pit. However, anthropological analyses have shown that they were dedicated to single persons. Deposits commonly consist of burned bones taken from selected body parts – mostly skulls, and limb bones – while other parts of the body were comparatively poorly represented if present at all (Jaskulska 2019). This tradition persevered at least until the 12th century and represents a regressive thread in regional funeral customs (Skrzyńska 2019a; Kalaga 2019; **fig. 1, 1.a**).

During the 7th-8th centuries, there was the next wave of colonization, which probably came from the same south-eastern direction. As suggested, this can be identified concerning the shape of cremation barrow graves. By degrees, these became a common form of burial rite, flourishing shortly before and during the period of Christianization (cf. **fig. 1, 1.b.1**). The most recent of the preserved cremation barrows were probably still being erected in the late 1100s and early 1200s.

The barrow tradition can be defined by several constructive peculiarities: mounds banked up using sand alone but also featuring stone and wooden constructions situated outside or/and inside their earthen bases. As regards the spatial distribution of purely earthen barrows, as well as barrows of stone construction, an interesting spatial division is discernible in the region (cf. **fig. 1, 2a-b**). Stone constructions tend to be most common in the north-eastern part of the area studied (mainly the Bielsk Plain), while earthen barrows are more commonly found in the south-west of the region (the Siedlce Upland). These differences, understood in a spatial and chronological context, can be explained as reflecting Baltic influences adapted to Slavonic burial customs in the north-eastern area (cf. **fig. 1, 2a**), while in other parts of the region, settlements retain homogeneous ethno-cultural patterns of Slavonic origin (cf. **fig 1, 2b**). Such regional patterns of occurrence could indicate the location of the Baltic-Slavonic cultural frontier, at which both ethnic components probably came into direct contact (Skrzyńska 2014).

Local differences are also present in the locations of burials, and how they were run. Specifically, these are: scattered or concentrated; under, inside, or on the surface of mounds; and with or without remnants of a cremation pyre. The adoption of new forms of burial was probably connected to broader social change: where older forms of pit graves were dedicated to single persons, barrows were collective graves, containing varying numbers of individuals. This last confirms that any given regional settlement could consist of numerous local communities. Internal connections between individual members (as decisive factors determining joint burial) remain little understood. We can only suppose that their relationships were territorial (e. g. as regards a single village) or ancestral. However, the cultural continuity between pit graves and barrows is visible in the collection of objects offered to the dead. In the case of the older tradition, the basic grave furniture consists of pots, probably ritually fragmented (Olczak/Wójcik 2019).

Proto-Christian cemeteries

This traditional pattern changed during the period of conversion to Christianity. The main indicator, in this case, is inhumation – which appears in barrows during the second half of the 11th century (Krasnodębski/Olczak 2019; Olczak/Krasnodębski 2019a; 2019b). This new form of burial then spread to the north-eastern part of the region, i.e. in the area of the Bielsk Plain – where mounds with stone constructions dominate (cf. **fig. 1, 2**). Their presence confirms that during the period of conversion this area was linked culturally to the Leśna Basin. The latter is in turn part of the historical Brześć Land, and was – from the beginning of the 11th century at least – under the strong influence of the Orthodox Church (Poppé 1968; Chomik 2006; Korobushkina 1999; Lysenka 2001; **fig. 1, 1.b.3**). In the western part of the investigated area (the Drohiczyn Upland), north of the Bug River, we know of only single inhumation barrows. As a rule, these are commonly added to older (or arguably simultaneously-used) barrow cemeteries featuring traditional cremation practices (cf. **fig. 1, 1.b.2**). In the southern part of the territory in question (the Siedlce Upland), only two cemeteries with skeleton burials are known from archival data. Both of these are located close to the Bug Valley.

It may thus be concluded that the influences of Eastern Christianity in the western part of the region were not as strong and stable as they were in the Brześć Area. The presence of single inhumation barrows on the Drohiczyn Upland and the Siedlce Upland suggests that Christianization of eastern origin, at least during the period when the presence of barrow graves was still widely accepted, was not supported directly by local political authorities. Unlike in the area of Brześć, burials may not be interpreted as reflecting a widespread, planned process of conversion.

Such a change of burial type implies modifications to other features of the burial process. The new skeleton burial forced communities to bury their dead shortly after their demise. Thus, barrows, which in the pagan tradition had contained many burials, excepting some special cases, then became graves for individuals (**fig. 3, C**). In this manner, the traditional custom of erecting regional barrow cemeteries, composed of relatively few mounds with collective burials, was transformed by the necessity to create large necropolises, in which numbers of graves reached several dozens or even over a hundred individual barrows (Korobushkina 1993; cf. also **fig. 3, A**). The dimensions of mounds, as compared with their earlier equivalents, became standardized and reduced (**fig. 3, B**).

At the same time, mostly in the western part of the region (the Drohiczyn Upland), another type of grave appeared, directly adapted to the rite of inhumation. Its main structural features were boulder kerbings, which created oval or rectangular frames for burials covered by stone »coats« (**fig. 4, B**). It was common for single graves to be added to the initial burial, in a manner which created a shared wall of stone-kerbing separating individual burials. Graves were constructed in parallel, regular rows, laid out in a south-north direction (**fig. 4, A**). This initial form of a stone-kerbed grave evolved into the canonical Christian form. The earliest graves, situated mostly on the outskirts of cemeteries, were constructed either completely without stones, or only using single headstones and/or symbolic frames, and/or »coats« built of small stones and pebbles.

Such graves were dedicated mostly to single persons, as it was in the case with the aforementioned skeleton barrows (**fig. 4, C**). The construction details and shape of these graves suggest that the need to implement the Christian custom can be seen to predominate in this type. However, while inhumation still dominates in the earliest phase of Christianization, cremation burials have also been found (cf. Dzik 2012; Radzikowska 2019; **fig. 1, 1.c.2-3**). Cremation might therefore be treated as a regressive custom preserved in the new cultural conditions. The presence of this method of burial confirms that the pagan tradition was still alive in the collective consciousness of the time. During the 12th century, the practice disappeared completely, evolving culturally into a series of apotropaic ceremonies (involving partly burned bodies: heads, hands and legs).

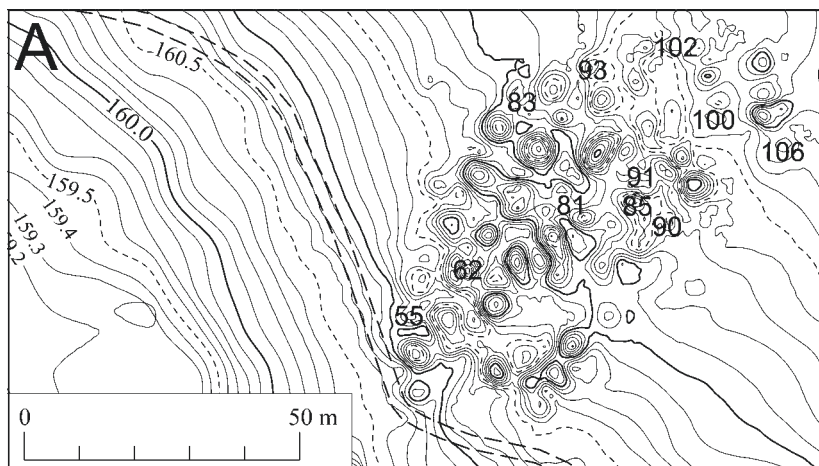


Fig. 3 Szczekotowo Range, Białowieża Forest (woj. podlaskie/PL), sect. 214, site 3. – **A** map of the cemetery. – **B** general view on skeleton barrows. – **C** the barrow no. 93 with skeleton burial. – (A illustration A. Małkowska / W. Małkowski; B photo H. Olczak; C photo D. Krasnodębski).

While the construction of barrows and stone-kerbed graves differs, some elements of the funeral rituals are common for both traditions. The distinct practices associated with the preparation of bodies and the arrangement of a burial site can be interpreted as evolving culturally in the same manner and direction. While no radical change of burial type occurred, some burial patterns were transformed as part of long-term processes. This applies to both innovative and progressive practices, which were gradually implemented, and to more

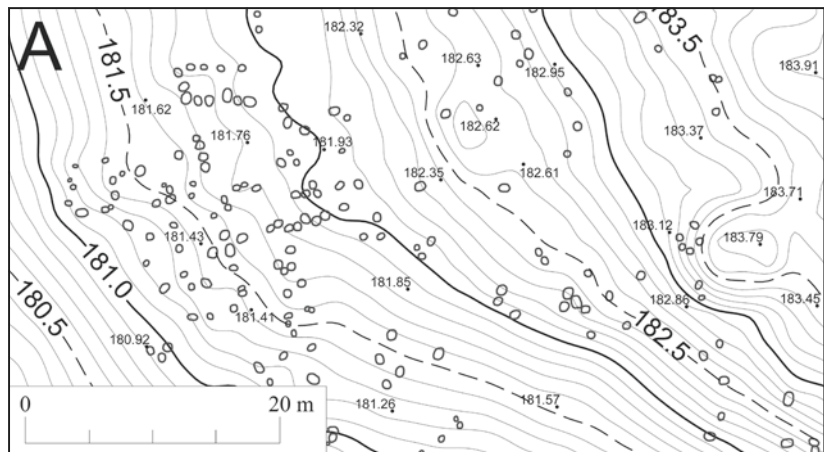


Fig. 4 Szczyty-Dzięciolowo (woj. podlaskie/PL), biritual cemetery with stone-kerbed graves. – **A** plan of the cemetery. – **B** general view on the grave no. 1 with external stone constructions. – **C** close-up of the grave no. 1. – (A illustration A. Małkowska / W. Małkowski; B photo D. Krasnodębski; C photo H. Olczak).

regressive, traditionally pagan practices, which deteriorated slowly during the time of Christianization. Analogous processes, very similar in both cases of the aforementioned cultural patterns, occurred in the funeral customs of the newly-converted rural communities of the Novgorodian Land (cf. Sobolev 2012).

For both types of grave – barrows and graves with stone settings – similar indicators for the changing location of burials were observed. In the first instance, the bodies were put directly on a patch of ground free

from plants and humus. Charcoal found inside the stone-kerbings and under the barrows suggests that space could additionally be subject to purification by fire. The manner of burial in the stone-kerbed graves was to place the bodies in shallow hollows – arguably a more recent solution – with this temporary form eventually leading to regular grave pits (cf. **fig. 4, C**). Both forms – barrows and stone-kerbed graves – were present during the 12th century, and constitute the next stage of adaptation of Christian patterns.

With the first skeleton burials, wooden coffins and other wooden protective constructions also began to appear in the region. From the 12th century onwards, coffins were constructed without metal elements, as may be deduced from their absence from both barrows and graves of stone construction, as well as from flat graves of early-Christian origin (see below). By contrast, the earlier standard burial practice was to inter bodies protected by coffins constructed with large iron elements. This difference of unknown cultural origin can also be interpreted as a significant progressive step towards the alignment of »rural« customs with »canonic« rules.

Convergence between barrows and stone-kerbed graves is also visible in the orientation and manner of burial arrangement. The western orientation can be perceived as dominant, but bodies lain in the opposite direction have also been found. This custom seems to have been observed in the earlier phase of the Christianization of funeral practices. Leading scholars postulate that the varying directions in which some bodies are placed could be connected to the sex or foreign origins of the individuals in question (cf. literature and discussion in: Dzik 2015; Skrzyńska 2019b). During the 12th century, the orientation of bodies started to be unified on the western model – which may also be interpreted as the next stage in the evolution of regional funeral customs.

A distinct feature of inhumation burials of both types is the ubiquity of diverse grave goods and ornaments. At the beginning of the conversion process, these could be classified into two separate groups, by location within the grave itself. The first, interpreted as grave goods, includes wooden and clay pots, single tools, weapons, objects of symbolic meaning, etc., placed in the grave during the funeral ceremony. The second, predominantly characteristic of female burials, commonly included jewelry and small tools found on the skeleton, or in well-defined places close to the body. These can be seen as ornaments for the deceased, which were added before the proper ceremony in the graveyard. The presence of such a rich and varied funerary equipment, when contrasted with the comparatively poor furnishings of pagan tradition, can be perceived as a material indicator of a new form of burial. Such customs survive in local funerary traditions only in the initial stages of funeral conversion and had been disappearing during the 12th century. Older traditions include the placing of jewelry in burials of women, though over time this started to die out.

Early Christian cemeteries

A form of burial similar to the canonic Christian rite had already appeared in the region as a fully-formed funeral custom, in the earliest phase occurring together with traditional cremations. Such cemeteries are datable to the period between the 11th and the early 12th centuries, and even earlier – these seem to accompany rural settlements, situated in the vicinity of major rivers and portages forming the basis of regional economic development (cf. **fig. 1, 1.d.1-2**). It appears to be connected to the settlement of Christianized communities intent on controlling and servicing these strategic points, probably in the period when the Piast and Rus' States had only begun to influence the territory. Funeral customs of these necropolises, excepting special grave formations without external constructions, possessing fully-shaped grave pits (**fig. 5, A-B**), can also be interpreted in the context of the local and regional evolution of funerary rites. The initial phases of this process can be seen as bi-ritualistic, with skeleton burials remaining dominant. The convergence of

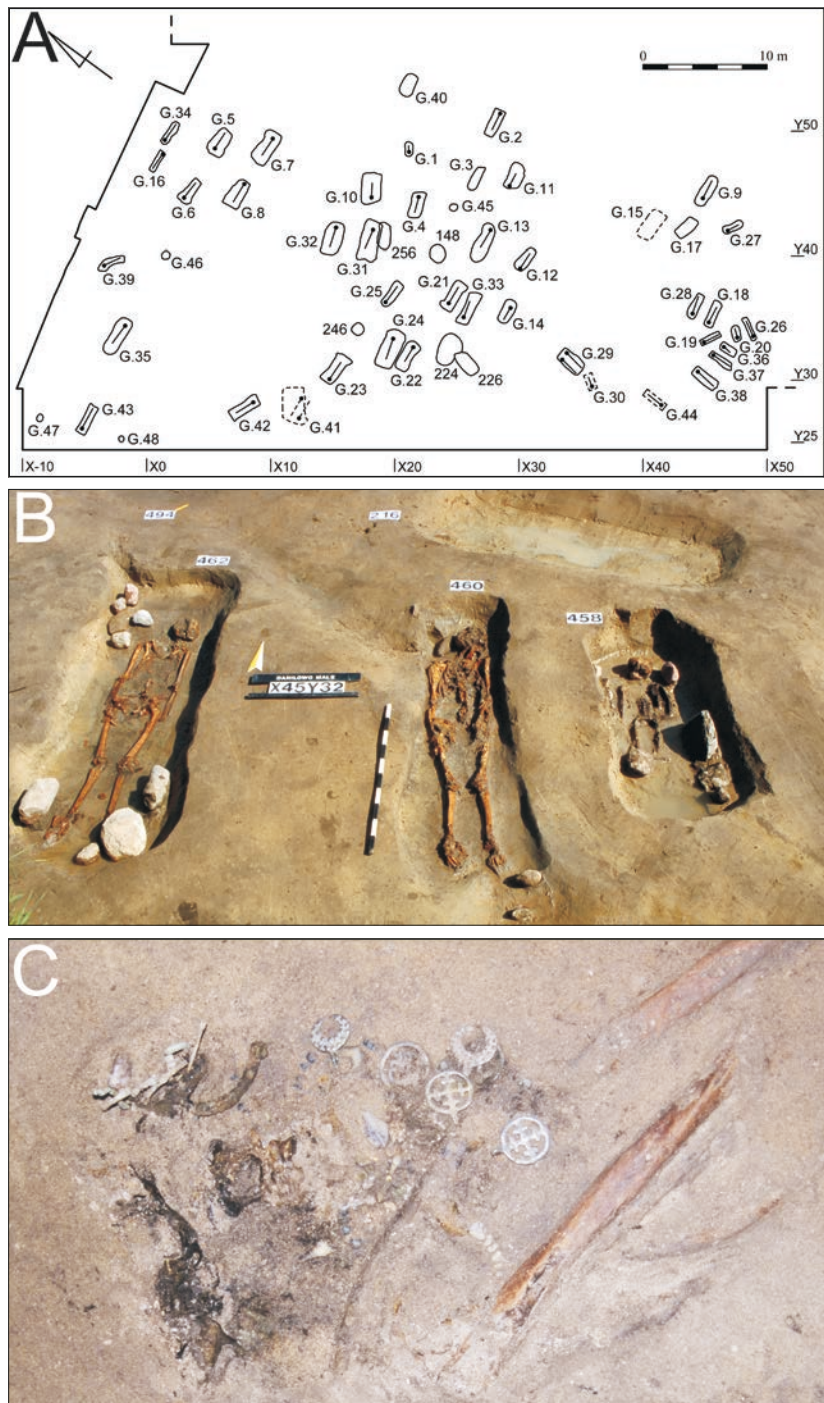


Fig. 5 Daniłowo Małe (woj. podlaskie/PL), biritual and skeleton cemetery of »rural« type. – **A** plan of the cemetery. – **B** general view on excavated graves. – **C** burial no. 9 with elements of the necklace. – (A illustration Z. Tragarz; B photo A. Koperkiewicz / P. Terendy; C photo D. Krasnodębski).

practices is also visible in other peculiarities of the funeral process: differences in orientation, the presence of grave goods, and rich furnishings of female burials – which are a particular feature of the last type of burial, and the standard occurrence of luxury objects, including Christian devotional artefacts are taken to indicate the higher material status of the whole community (fig. 5, C).

Around the beginning of the 12th century, another group of flat inhumation cemeteries appeared in the region. These can be interpreted as the oldest evidence of proper Christian communities. Their flat graves, situated in rows laid out in a general north-south direction, contain poorly furnished burials (fig. 6, A). The assemblage of grave goods is commonly reduced to jewelry and minor tools – common elements of female

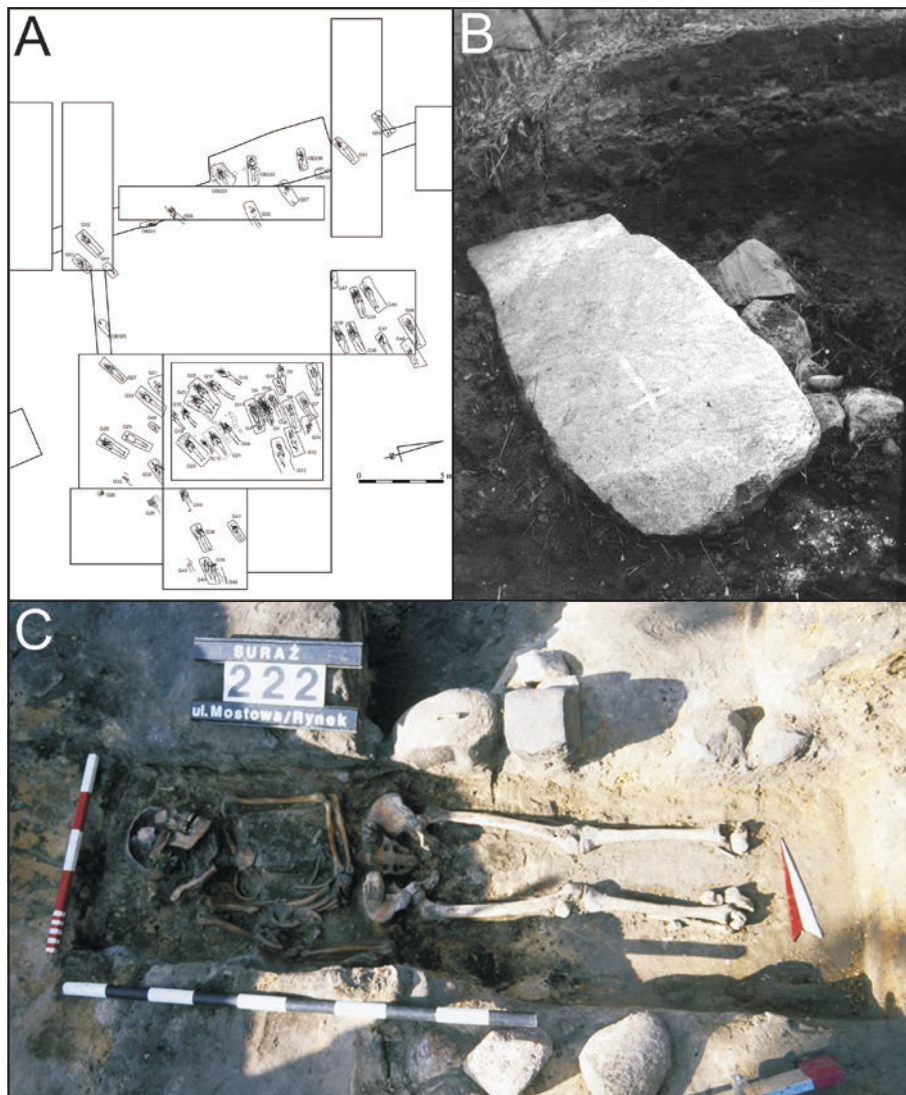


Fig. 6 Suraż (woj. podlaskie/PL), site 2: flat skeleton cemetery of »proto-urban« type. – **A** plan of the excavated parts. – **B** gravestone with the cross image probably belonging to grave no. 7. – **C** grave no. 222 with »quasi-kerbing« probably pillars for the cover of the gravestone.– (A illustration A. Bieńkowska / H. Olczak; B photo from the Archiv of Podlavian Museum in Białystok; C photo D. Krasnodębski).

and male dress. Bodies are oriented to the west, supine, with arms in most cases lying freely by the side of each body, or with hands clasped together across the abdomen (**fig. 6, C**). Most individuals buried were put into grave pits in coffins (constructed without nails), as (probably) covered in shrouds. The presence of lasting elements marking the localization of single graves with the oldest in the region unique examples of grave-stones marked by engraved crosses (**fig. 6, B**), sometimes presumed to have been stabilized on stone pillars similar to stone-kerbings (cf. **fig. 6, C**), may also be considered as a significant feature of this region. The most characteristic feature of these necropolises was their location in the main socio-economic centres of the region, where they were already performing proto-urban functions (cf. **fig. 1, 1.d.2**). The cemeteries, thus newly-integrated into the cultural landscape of these proto-towns, alongside the earliest known churches in the region, served as markers of the spatial sacralization (cf. Myga-Piątek 2012). Archaeological research and historical data both confirm that cemeteries discovered at such sites were, in most cases, combined with the oldest Christian temples or shrines, built for local elites, probably representing the outgoing power of the Piast or Rus' Princedoms. Unlike rural cemeteries, which seem to be strongly connected to local ethno-cultural heritage, the arrangement of these cemeteries and constructional features of single graves had a more universal character: the same solutions can be seen to have been implemented in the proto-towns of Orthodox Rus' and Catholic Poland, as in other states of Roman-Catholic confession.

ARCHAEOLOGICAL DATA AND RESEARCH QUESTIONS

The analyses reveal that regional funeral rites consist of two main streams: rural and proto-urban. In spite of the common feature of inhumation, distinguishing them as proto-Christian and early-Christian, the two can be seen as distinct on account of typological, spatial and chronological differences.

Rural funeral customs were not uniform. In the period of conversion, they comprise three dominant types of cemeteries: with barrows, with stone-kerbed graves, and with flat pit graves without distinctive, stable constructions preserved above ground. According to the latest research, this last type of grave can be seen as the oldest amongst inhumation burials, initially scattered as single points in the pagan context. During the next few decades, the inhumation in barrows began to occur, and gradually became the predominant form of a grave in the region, combined with stone-kerbed graves – both types becoming typical for proto-Christian, rural settlements between the second half of the 11th and the first half of the 13th century. The latest of these, recognized as early-Christian, were cemeteries established in the so-called proto-towns, which developed alongside the main strongholds of the region. Their characteristic features seem to indicate establishment *apud ecclesiam*. The presence of churches is, in some cases, confirmed directly or indirectly by archaeological research, or suggested by written sources (Jaskanis 2008; Andrzejewski/Sikora 2011; Pawlata 2014).

The question of the ethnic identity of the settlers in the period of religious conversion is also significant. Special attention should be paid to the geopolitical position of this territory, located on the border of the Mazovian and Rus' Princedoms. As the ethno-cultural contact zone between the Western and Eastern Slavs and Balts, locals and aliens, it was this territory – influenced as it was confirmed by multi-directional and multi-cultural experiences – which created favorable conditions for the syncretic fusion of new, sometimes unique, cultural patterns.

Who were these people – the real inventors of the cultural and ideological changes in the middle Bug and upper Narew areas? Local settlers »mixed« with incomers? And if so, how to recognize them? The main issue, in this case, is the recognition of the palaeogenetic features of a population that generated such a complex and fascinating cultural picture. The first steps in resolving this problem were the genetic analyses carried out by our team – the first of their kind to be conducted on such a scale on the population of medieval Poland (see below).

By analyzing the genetic data from the population living on the Mazovian-Rus' border during the period of conversion and by comparing the genetic composition between groups practicing different burial rituals and inhabiting different microregions we hoped to gain a better insight into the spatiotemporal cultural transitions in the region. The detection of genetic homogeneity between the groups would suggest that transitions were culturally transmitted and did not entail major demographic changes. The identification of pronounced genetic differences could in turn suggest that distinct cultural practices were brought by groups of incomers from outside the region.

THE HUMAN BONE MATERIAL AND SELECTION CRITERIA FOR GENETIC STUDIES

From 73 representative sites, 21 cemeteries and single graves were chosen (cf. **fig. 1**), from which 104 human bone or tooth samples were taken. The main criteria for selection were: the chronological and spatial distribution of cemeteries in the sampled territory, the different types of graves and burials, and the degree of preservation of the bones/teeth themselves. The state of preservation was visually assessed. The densest and least perforated and fractured bones and teeth with the fewest possible fractures and openings

no.	site	region	total number of samples	bone sort (number of samples)			positive results (number) %			positive results (total) %
				teeth	other bones	cremation	teeth	other bones	cremation	
inhumation and biritual barrows										
1	Czarna Wielka, site 2	Drohiczyn Upland	1	-	-	1	-	-	0	0
2	Czarna Wielka, site 3	Drohiczyn Upland	1	1	-	-	0	-	-	0
3	Puszcza Białowieska, »Jelonka Range«, site 9	Bielsk Plain	1	1	-	-	(1) 100	-	-	(1) 100
4	Puszcza Białowieska, »Jelonka Range«, site 10	Bielsk Plain	1	1	-	-	(1) 100	-	-	(1) 100
5	Puszcza Białowieska, »Szczekotowo Range«, site 3	Bielsk Plain	3	2	1	-	(2) 100	(1) 100	-	(3) 100
cemetery with barrows and stone-kerbed graves										
6	Szczyty Dzięciołowo, site 1	Bielsk Plain	2	1	1	-	(1) 100	(1) 100	-	(2) 100
cemeteries with stone-kerbed graves										
7	Czarna Wielka, site 1	Drohiczyn Upland	6	1	5	-	(1) 100	(2) 40	-	(3) 60
8	Czartajew, site 1	Drohiczyn Upland	1	1	-	-	(1) 100	-	-	(1) 100
9	Czekanów, site 1	Siedlce Upland	15	11	2	2	(9) 82	(2) 100	0	(11) 73
10	Klepacze, site 1	Drohiczyn Upland	6	6	-	-	(6) 100	-	-	(6) 100
11	Niewiadoma, site 3	Siedlce Upland	4	2	2	-	(1) 50	(1) 50	-	(2) 50
12	Niewiarowo Sochy, site 1	Drohiczyn Upland	9	2	7	-	0	(1) 14.3	-	(1) 11.1
13	Rybałty, site 1	Drohiczyn Upland	1	-	1	-	-	0	-	0
14	Skiwy Małe, site 1	Drohiczyn Upland	5	2	-	3	(2)100	-	(1) 33.3	(3) 60
15	Twarogi Lackie, site 9	Drohiczyn Upland	5	3	-	2	(2) 66.5	-	0	(2) 40
16	Wierzbice Strupki, site 1	Siedlce Upland	2	-	2	-	-	(1) 50	-	(1) 50
flat skeleton and biritual cemeteries										
17	Daniłowo Małe, site 1	Upper Narew Valley	22	8	10	4	(8) 100	(1) 10	(1) 25	(10) 45.5
18	Suraż, site 2	Upper Narew Valley	16	6	10	-	(6) 100	(8) 80	-	(14) 87.5
19	Suraż, »Piszczewo Range«, site 2	Upper Narew Valley	1	1	-	-	(1) 100	-	-	(1) 100
burials of atypical forms and locations										
20	Czekanów, site 2	Siedlce Upland	1	-	1	-	-	0	-	0
21	Niewiadoma, site 1	Siedlce Upland	1	-	-	1	-	-	0	0
Total			104	49	42	13	(42) 85.7	(18) 42.9	(2) 15.4	(62) 59.6

Tab. 1 Samples of palaeogenetic material taken from cemeteries of the medieval Mazovian-Rus' frontier (middle Bug and upper Narew basins) according to Molak/Suchocka/Bogdanowicz 2019, app. 14.1.

(root holes or caries) were selected from the material available for each individual. In the case of cremated remains, the least burned fragments were assessed based on the color and texture of the bone.

Samples were taken from five barrow cemeteries, one cemetery of two sections: barrow and stone-kerbed graves, ten cemeteries with stone-kerbed graves, three flat cemeteries with pit graves and two other burials of atypical forms and locations: one cremation pit grave discovered inside a stronghold, and the secondary skeleton burial of double newborns discovered in a barrow. Database related to genetic analyses is presented in **table 1**.

RETRIEVAL OF GENETIC INFORMATION FROM THE MATERIAL

For a better understanding of the cultural changes concerning the medieval population of middle Bug and upper Narew basins, samples of the human bones were subjected to genetic analyses. Mitochondrial hyper-variable region I (HVRI) sequence, as well as mitochondrial coding region Single Nucleotide Polymorphisms (SNPs) were studied to assign individuals to haplogroups, i. e. groups based on genetic affinity, which are routinely used for population genetic analyses.

The selected material was processed in a dedicated ancient DNA laboratory at the Museum and Institute of Zoology, Polish Academy of Sciences, in accordance with the guidelines for avoiding contamination (Cooper/Poinar 2000; Willerslev/Cooper 2005). For samples for which enough material was available, two samples were collected and processed. Bone and tooth material was cleaned, pulverized and subjected to DNA extraction using the AutoMate Express™ Forensic DNA Extraction System (Applied Biosystems) as described in Molak et al. (2019). The mitochondrial fragment of the HVRI was amplified by PCR and sequenced by the Sanger method. In addition, HVRI and HVRII fragments as well as 22 mitogenomic fragments comprising SNPs were amplified in multiplex PCR reactions. The products of these reactions were built into DNA libraries double-indexed individually for each individual and sequenced on the Illumina MiSeq platform as described in Molak et al. (2019). The obtained sequence reads were aligned to the revised Cambridge Reference Sequence (GenBank acc NC_012920) with BWA (Li/Durbin 2009). Only SNPs with the minimum base quality of 25 and coverage of 10 were accepted. Haplogroups were assigned to individuals using the HaploGrep (Kloss-Brandstätter et al. 2011), build 17 software.

RESULTS OF GENETIC ANALYSES

Mitochondrial haplogroups determined for 60 individuals² (out of 104 individuals subjected to DNA analyses) from the Medieval Eastern Mazovian (MEM) population were distributed as follows: 46 % HV (including H and all other lower rank HV haplogroups), 7 % J, 10 % T, 10 % U, 7 % I and 20 % others (including only the broadly determined haplogroups for individuals with limited genetic data). This data set was compared with other ancient and modern populations for which data on mitochondrial haplogroup diversity are available. Correspondence analysis (CA) based on haplogroup frequency, by which the relative differences between populations are estimated and visualized, revealed a considerable genetic distance between the MEM population and modern Central, Northern and Eastern European populations at the mitochondrial haplogroup frequency level (**fig. 7, A**; after Molak/SucHECKA/Bogdanowicz 2019). The division into subgroups according to the burial type or geographical location within the studied region (**fig. 7, B-C**; after Molak/SucHECKA/Bogdanowicz 2019) placed MEM even further away from other populations. In addition, MEM was not shown to be closer genetically at the haplogroup frequency level to any of the Polish popula-

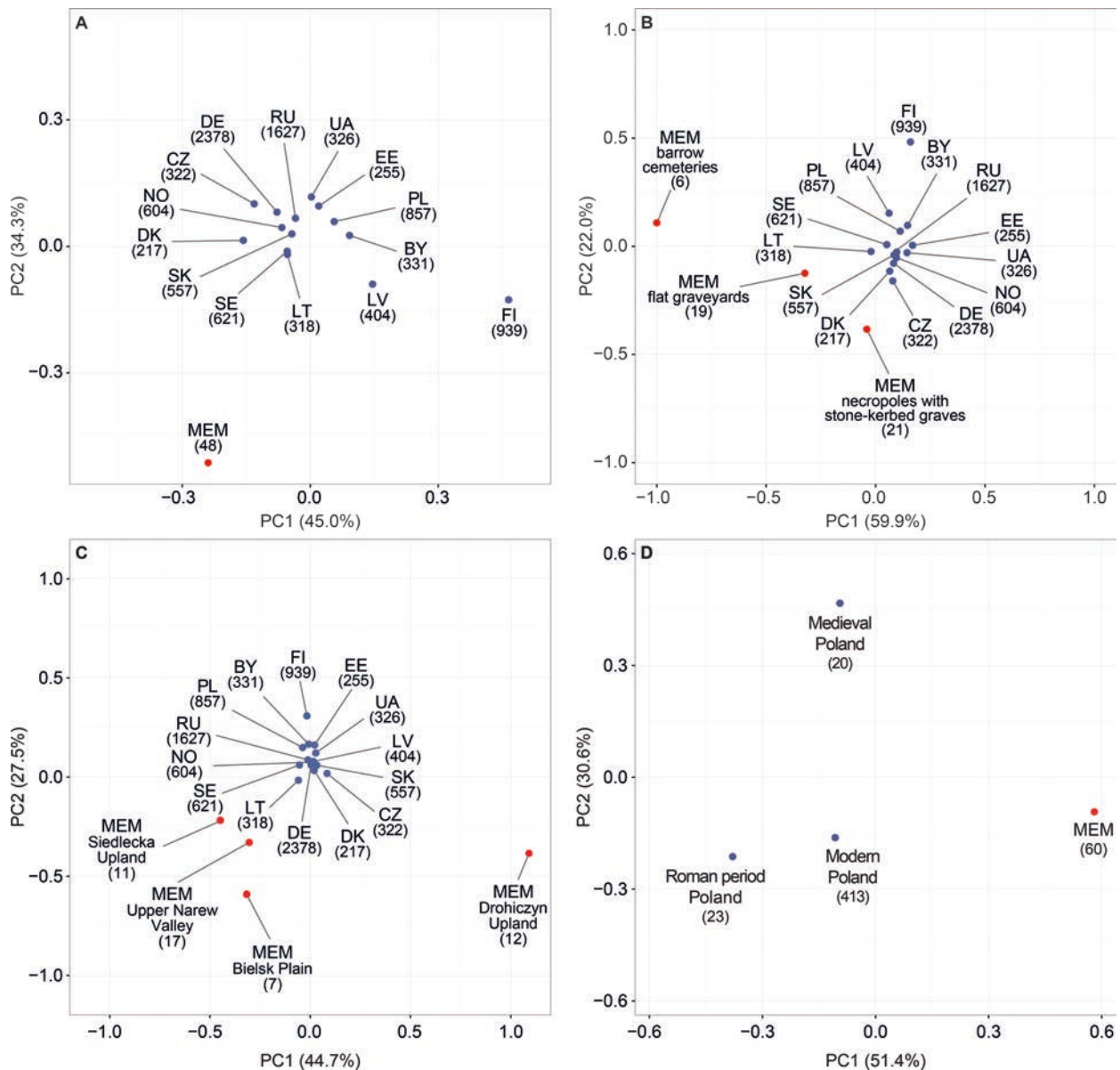
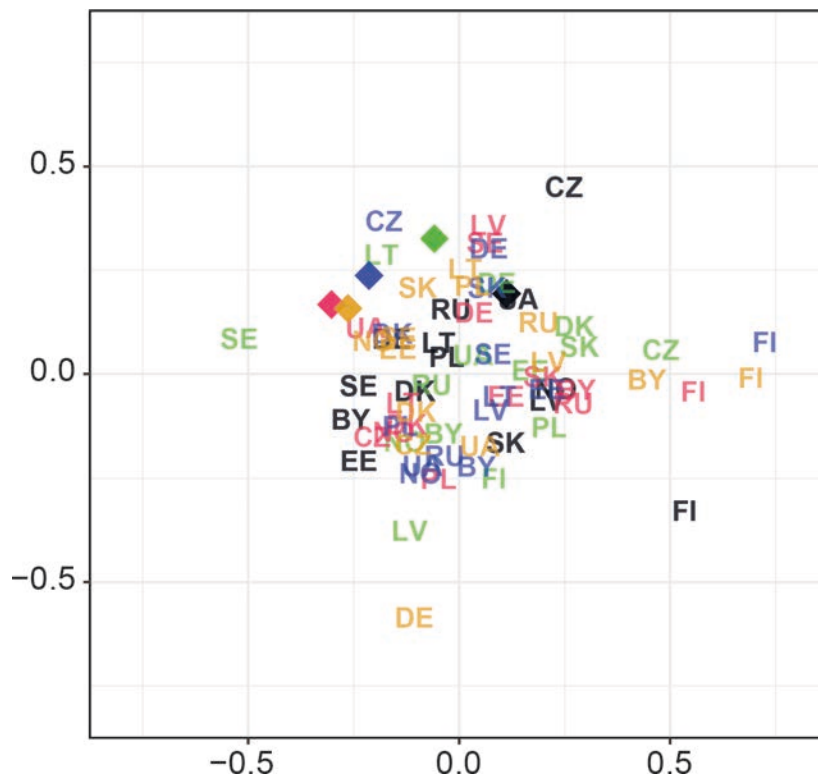


Fig. 7 Correspondence analysis for haplogroup frequencies between the Medieval Eastern Mazovian (MEM) population and modern European populations (A-C) or the ancient population from the Polish territory (D). – A MEM population as a whole. – B MEM population divided by burial types. – C MEM population divided by geographical region compared to modern populations from Central, Northern and Eastern Europe (metapopulations compiled from multiple published sources available on Eupedia.com; only L, HV [including subclades], J, T, U, I, W and X haplogroup frequencies in each population were included in the analysis). – D MEM population as a whole compared to the Polish population at different temporal periods (after Juras et al. 2014); »Modern Poland« population here is based on Grzybowski et al. (2007); the haplogroups included in the analysis were HV (including subclades), I, J, M, N (excluding B, I, J, R, T, U, W and X), T, U, W, X and »others« (L, R and B); groupings after Juras et al. (2014). – (After Molak/Sucecka/Bogdanowicz 2019, figs 14.3; 14.4).

tions from different temporal periods (Roman, Medieval, Modern; fig. 7, D, after Molak/Sucecka/Bogdanowicz 2019).

To verify whether such a large genetic distance from modern populations is driven by the small sample size of the studied MEM population alone, we reanalyzed the data from Molak et al. (2019) using the modern populations downsampled to the size of the MEM population. We randomly drew 48 samples from each population to match 48 individuals from the MEM population included in the original CA in Molak/Su-

Fig. 8 Correspondence analysis (CA) using subsampled modern European populations in five iterations (each iteration represented in a distinct color) for all samples excluding those assigned to an »other« haplogroup. N = 48 for each population. MEM population is shown by a diamond; modern European populations are represented by 2-letter country codes. – (Illustration M. Molak)



checka/Bogdanowicz (2019); only individuals with haplogroups assigned as L, HV (including H and other HV subclades), J, T, U, I, W and X were included in the CA. Samples assigned to an »other« haplogroup were excluded because this category might comprise samples that were incorrectly assigned a higher rank haplogroup due to insufficient sequence data to refine the haplogroup assignment and thus be poorly comparable to »other« haplogroups from modern populations. The subsampled modern populations with their recalculated haplogroup frequencies were then again subjected to the CA using FactoMinerR package (Lê/Josse/Husson 2008) in R (R Core Development Team 2017). Both scenarios of subsampling and the CA were performed five times. This reanalysis showed that with small sample sizes the calculated relative distance among populations increases but it is more equally distributed (fig. 8). In the recalculated CA all modern European populations are placed at a comparable distance to each other as well as to MEM. The exception is Finland, which even in this downsampling analysis is usually placed further away from other populations. Considering the results of this CA, which shows no elevated genetic distance of MEM from the other analyzed populations, we cannot reject a hypothesis of genetic continuity between MEM and modern populations from Central, Northern and Eastern Europe.

Despite the small sample size, a comparative analysis of haplogroup variation within MEM suggests that the Drohiczyn Upland was more diverse genetically than other geographical microregions within MEM. Unlike in the other microregions, in the Drohiczyn Upland HV haplogroup did not dominate (7 % versus more than 50 % of haplogroup diversity in other microregions) and more haplogroups were observed (fig. 9, A), although differences in haplogroup frequencies between microregions were not statistically significant (Chi Square Test of Independence, $p=0.23$). The Drohiczyn Upland was mostly characterized by cemeteries with stone-kerbed graves. This burial type was also characterized by the highest mitochondrial diversity with no clear dominance of HV haplogroup (fig. 9, B), however again the differences between haplogroup frequencies among the groups based on burial type were not found statistically significant (Chi Square Test of Independence, $p=0.59$).

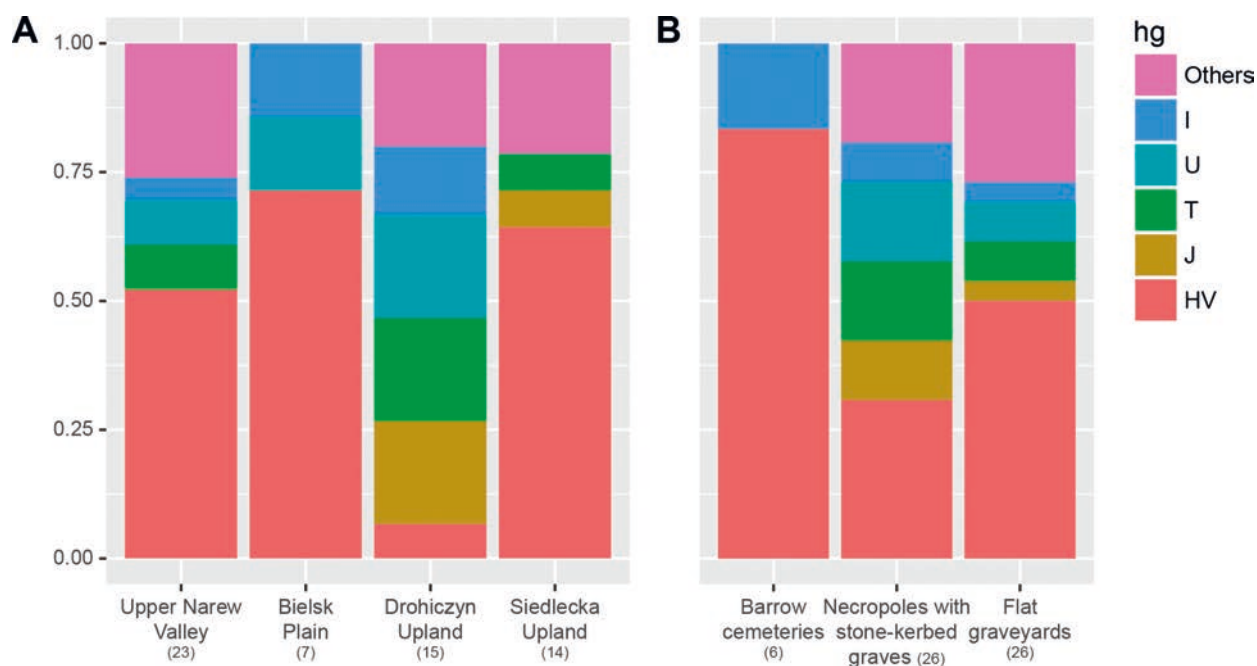


Fig. 9 Haplogroup diversity within the MEM population. Comparison between subgroups based on geographical microregion within Eastern Mazovia (A) and burial type (B). – (Illustration M. Molak).

It is worth noting that in the study by Molak et al. (2019) one of the individuals was assigned to M9a1a haplogroup. To our knowledge, there is no record of this predominantly South-East Asian haplogroup in modern or ancient Europeans and the M macrohaplogroup seems to have been lost from the European diversity pool around the time of the Last Glacial Maximum (Posth et al. 2016). Unfortunately, this individual yielded only partial results for genetic testing and the haplogroup assignment based on the HVR sequence could not be additionally confirmed by genotyping of SNPs using high throughput DNA sequencing on a MiSeq platform (Illumina). The extraordinary finding of an individual with a typically Asian mitochondrial haplogroup in the MEM population requires additional confirmation but surely is an interesting case, that, if ever confirmed, could potentially remodel some views on the European mitochondrial diversity in medieval Central Europe.

Overall, to fully understand the population structure of MEM and the influence of Christianity's expansion on the genetic continuity in the region more studies are needed that will attempt to analyze genetic data with a higher resolution. The skeletal material from MEM proved challenging for genetic analyses, as, despite several attempts, only isolated nuclear markers could be analyzed and the efficiency of mitochondrial DNA analysis also turned out fairly low (59.6% samples yielded DNA and for 57.7% the haplogroup assignment could be determined). It is, however, worth noting that in two cases DNA data were successfully obtained from cremated remains, in which DNA is usually damaged beyond the point of retrieval possibility (Schwark et al. 2011). These two samples, one from Danilowo Małe (woj. podlaskie/PL) in the Upper Narew Valley (assigned to the haplogroup HV0) and one from Skiwy Małe (woj. podlaskie/PL) in the Drohiczyn Upland (haplogroup J) produced only single ~200bp Sanger sequences, and the latter gave reads for eight mtSNP amplicons. Nevertheless, they indicate that further effort to obtain genetic data from cremated remains might be worthwhile. This result, along with ever-improving methods for extraction and analysis of DNA from ancient remains, gives hope for further studies that will strive to investigate the genetic make-up of pre-Christian Slavic populations, who customarily cremated their dead, as well as for comparing them with later populations.

DISCUSSION

The results of the pilot project are very promising for research relative to the cultural development of societies living in the middle Bug and upper Narew regions in medieval times. Interdisciplinary studies on the process of religious conversion show that Christianity, implemented bilaterally in accordance with Catholic and Orthodox rites, ensured gradual change in the traditional cultural landscape over around 250 years. Despite this, some aspects of pagan funeral customs were preserved, and acculturated through to the beginning of the modern period, becoming the background for regional folkloric traditions which sometimes survive to this day.

Cultural factors inherent in funerary rites reveal data that contribute to modern efforts to reconstruct the historical conversion process, which can already be interpreted as polarized in line with ethnic, social, cultural and spatial conditions. Rural societies, except for scattered individual communities, had to be seen as formally Christianized from the second half of the 11th century, when inhumation appeared in the frame of traditional barrow funeral customs, widely in the eastern and north-eastern parts of the region. On the other hand, cemeteries with stone-kerbed graves appeared mostly in the west – on the Drohiczyn Upland. Both groups of grave constructions are considered as archaeological evidence of settlement of Eastern and Western Slavonic origins. Users of barrows have been seen as semi-Christianized propagators of local traditions, which is further confirmed by initial palaeogenetic analyses. The second rural population can be seen as comprising alien settlers from Northern Mazovia (Miśkiewicz 1981), Varangian Rus' (Kiersnowska 1992), or as locals living in the territory where the building of barrows was forbidden by the Church (Dzik 2015). It is worth noting that genetic analyses reveal that the users of stone-kerbed graves from the Drohiczyn Upland were genetically different from their neighbours from other areas of the region. This observation corresponds to patterns obtained from analyses of the spatial and chronological development of settlements, showing the Drohiczyn Upland to have been settled only sparsely in the earlier phase of the medieval period, i. e. in the 6th-10th centuries (Skrzyńska 2014). Consequently, in the light of the recent palaeogenetic research, the »rapid« bloom of settlement discernible between the second half of the 11th and the second half of the 13th centuries could have been the result of planned colonization, as a consequence of the territorial annexation of states. The new settlers can be seen as having been formally Christianized already, bringing fully-developed funerary rituals (including the crucial prescription of inhumation), as incorporated into their own traditional beliefs. The hypothesis of colonization (or organized migration) is supported by analyses of distinctive pottery, which is completely different from indigenous patterns, in terms of style, form, and decoration, as well as production techniques (Wójcik 2013). These peculiar pots, known as the »Drohiczyn Type«, appeared in the region rapidly, and soon became a distinguishing feature of the region's material culture in the late 11th and in the 12th century. It is worthy of note that a massive range of these products corresponds to the territory settled by populations who constructed stone-kerbed graves (cf. **fig. 1, 3**).

Such observations fit well with the theoretical background of ceramological research. The qualitative and quantitative changes of stylistic and/or technological processes of pottery production reflect the deep social transformations affecting both the producers and consumers of pottery. The rapid change in pottery techniques or forms constitutes, in the opinion of many authors, material evidence of deep social transformations, including the change of population (Arnold 1985, 234 ff.; Rice 1987, 456; with literature). Similar phenomena are associated most often with the presence of potters-incomers, who in the new place are trying to produce pots according to the same patterns, as in areas previously inhabited; this includes raw material, technique and style. These features are for producers and users of pottery the essential sign of group and cultural identity (cf. Bobrinskij 1978, 76; Stilborg 1997).

All of this makes well-founded premises about the presence of newcomers in the investigated area. Who were they? Genetic data does not provide an unequivocal answer. More essential facts and considerations

should result from further advancement of the current research, with a view to full reconstruction of the palaeogenetic origins of local populations being achieved.

Surprisingly, in border regions, genetic differences perceived on the Drohiczyn Upland do not overlap with the main cultural-differentiation factors, i.e. types of graves (fig. 1, 1.b; 1.c). The palaeogenetic structure of populations who buried their dead in the stone-kerbed graves found on the Bielsk and Siedlce Plains seems to be similar to those found in the barrows, perceived to be graves constructed by indigenous communities. Similar results are shown in the case of cemeteries representing examples of rural flat-inhumation necropolises. Does this mean that the form of proto-Christian grave itself spread independently of the »human factor«?

The second question relates to the proto-town cemetery in Suraż (woj. podlaskie/PL). The possible presence of an individual of Asian origin suggests that the communities of regional centres were not homogeneous, while probably being to some degree affiliated genetically with settlers of foreign origin³. Palaeogenetic evidence shows that local heads of political, religious, administrative, economic and military structures could be foreigners accompanying (or creating) local elites. But, for the moment, such a scenario must remain the subject of hypothetical discussion only (cf. Dulnicz 2001).

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Notes

- 1) Archival records collected by: S. Nosek (1957), K. Musianowicz (1960), H. Zoll-Adamikowa (1975); recently: K. Skrzyńska (2014); M. Dzik (2015).
- 2) DNA tests provided positive results in 62 cases (cf. tab. 1). In two cases haplogroups could not be determined, even broadly.
- 3) The presence of an Asian population on the Polish territory in the Middle Ages has recently become a topic of discussion

broadly supported by genetic research (Płoszaj et al. 2017; Witas/Płoszaj/Jędrychowska-Dańska 2017). The same questions also appeared in the case of a cemetery in Šindolka (okr. Nitra/SLO), where haplogroup J was detected, and interpreted as common for Western Eurasia, but not identified in the Magyar population of medieval Southern Europe (Nagy et al. 2016).

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Zusammenfassung / Summary / Résumé

Mittelalterliche Bevölkerungen an der Grenze zwischen Masowien und Russland in der Zeit der Christianisierung. Vorläufige Ergebnisse archäologischer und genetischer Analysen

Das Gebiet des ehemaligen Ostpolens war Teil der breiteren ethnisch-kulturellen Grenze, die sich zwischen dem polnischen Masowien und der Turowischen Rus' und Wolhynien zwischen der zweiten Hälfte des 10. und der zweiten Hälfte des 13. Jahrhunderts entwickelte. Insgesamt wurde seine mosaikartige Kulturlandschaft durch den traditionellen, heidnischen Hintergrund und christliche Einflüsse geprägt, die den direkten Kontakt zwischen der katholischen und der orthodoxen Kirche widerspiegelten, als die politische Grenze Gestalt annahm, wahrscheinlich in der ersten Hälfte des 11. Jahrhunderts. Hauptmerkmale des kulturellen Wandels im Zusammenhang mit der religiösen Konversion sind die als Grabhügel angelegten Körpergräber, Friedhöfe mit Steingräbern und die flachen Friedhöfe der ländlichen Bevölkerung und der proto-urbanen Gesellschaften. Aus all diesen Gräbern wurden Personen ausgewählt, die archäogenetisch untersucht wurden. Genetische Analysen zeigen z.B., dass die Menschen, welche die Steingräber im Drohiczyn-Hochland bauten, das seit der zweiten Hälfte des 11. Jahrhunderts den westlichsten Teil des Rus-Territoriums bildet, sich von ihren Nachbarn unterschieden, die im gleichen Zeitraum andere Teile der Region besiedelten. Diese Beobachtung korrespondiert mit Untersuchungen der Siedlungsentwicklung in räumlicher und zeitlicher Hinsicht, die zeigen, dass ein »rascher« Siedlungszuwachs in diesem Gebiet auf eine geplante Kolonisierung nach einer staatlichen territorialen Annexion im zweiten Viertel des 11. Jahrhunderts zurückzuführen sein könnte. Auch die Existenz einer genetischen Kontinuität zwischen der mittelalterlichen Bevölkerung an der polnisch-ruthenischen Grenze und der modernen Bevölkerung aus Mittel-, Nord- und Osteuropa muss berücksichtigt werden. Auf diese Weise können genetische Analysen neue Forschungsfelder definieren und neue Argumente für ethno-kulturelle Interpretationen liefern.

Medieval Populations of the Mazovian-Rus' Frontier in the Time of Christianization. Preliminary Results of Archaeological and Genetic Analyses

The territory of former Eastern Poland formed part of the wider ethno-cultural frontier developed between Polish Mazovia and Turovian Rus' and Volhynia between the second half of the 10th and the second half of the 13th century. Overall, its mosaic-like cultural landscape was formed by the traditional, pagan background and Christian influences reflecting direct contact between the Catholic and Orthodox Churches as the political border started to take shape, probably in the first half of the 11th century. The main markers of the cultural change related to the religious conversion are inhumation graves, appearing as barrows, cemeteries with stone-kerbed graves and the flat graveyards of rural populations and proto-urban societies. Individuals chosen from all of these were archaeo-genetically examined. Genetic analyses show, for example, that the people who built the stone-kerbed graves in the Drohiczyn Upland, from the second half of the 11th century forming the most western part of the Rus' territory, were different from their neighbours settling other parts of the region in the same period. This observation corresponds with studies of the development of settlement, spatially and chronologically, which show that a »rapid« growth of settlement in this area could be due to a planned colonization after a state territorial annexation in the second quarter of the 11th century. The existence of a genetic continuity between the medieval population of the Polish-Ruthenian frontier and modern populations from Central, Northern and Eastern Europe must also be considered. Thus, genetic analyses can define new fields of research and provide new arguments for ethno-cultural interpretations.

Les populations médiévales de la frontière russo-mazovienne à l'époque de la christianisation.

Résultats préliminaires des analyses archéologiques et génétiques

Le territoire de l'ancienne Pologne orientale faisait partie d'une vaste zone frontière entre la Mazovie polonaise et les contrées russes de Turovie et de Volhynie de la deuxième moitié du 10^e à la deuxième moitié du 13^e siècle. En outre, sa mosaïque culturelle se composait d'un substrat païen traditionnel et d'influences chrétiennes qui reflétaient les contacts directs entre les Églises catholique et orthodoxe à la naissance de la frontière politique, probablement dans la première moitié du 11^e siècle. Les principaux marqueurs de changements culturels liés à la conversion religieuse sont des tombes à inhumation sous l'apparence de tumuli, des nécropoles constituées de tombes bordées de pierres et les nécropoles à tombes plates des populations rurales et des sociétés proto-urbaines. Des individus sélectionnés dans ces différents sites furent soumis à des examens archéologiques et génétiques. Les analyses génétiques montrent par exemple que les communautés qui ont érigé des tombes bordées de pierres dans la région de Drohiczyn, et qui occupaient la partie la plus occidentale du territoire russe dès la seconde moitié du 11^e siècle, étaient différents de leurs voisins établis dans d'autres parties de la région à la même époque. Cette observation correspond aux études sur l'évolution spatiale et chronologique de l'habitat qui aurait connu un essor »rapide« dans cette région dû à une annexion territoriale par un État dans le deuxième quart du 11^e siècle, suivie d'une colonisation. Il faut également retenir l'existence d'une continuité génétique entre la population médiévale de la frontière ruthéno-polonaise et des populations modernes du Centre, du Nord et de l'Est de l'Europe. Les analyses génétiques établissent ainsi de nouveaux domaines de recherche et fournissent de nouveaux arguments aux interprétations ethnoculturelles.

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Schlüsselwörter / Keywords / Mots clés

Polnisch-Russische Grenze / Mittelalter / Beginn der Christianisierung / slawische Begräbnissitten / genetische Analysen
Polish-Rus' frontier / Middle Ages / dawn of Christianization / ethnic Slavonic funeral customs / genetic analyses
Frontière russo-polonaise / Moyen Age / aube de la christianisation / coutumes funéraires slaves / analyses génétiques

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