

SKOMANTAI HILL-FORT IN WESTERN LITHUANIA: A CASE STUDY ON HABITATION SITE AND ENVIRONMENT

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Abstract

Hill-forts are visually distinct archaeological monuments of the Lithuanian landscape; despite excavations that have recently become more intensive, more often than not we still make judgments of hill-forts on the basis of their surviving image, which is assumed to reflect the final stage of their existence. Usually our knowledge about the size of the settlement at its foot, its planigraphy, and of course chronology, is too slender to make any conclusions. By employing complex non-destructive research methods (palynological, geochemical, lithological and geomagnetic analysis, as well as ¹⁴C and thermoluminescence dating), the article discusses the time of the rise and the abandonment of Skomantai hill-fort and settlements, the hierarchical relations with the hill-fort as an object forming the settlement structure of the neighbouring area, both settlements at the foot of the hill, and the surrounding burial grounds and monuments, all of which make up a micro-region. As the economic model of the community and the social structure of society changed, the relations between the hill-fort and the settlements changed, as did the purpose of the hill-fort.

Key words: western Lithuania, Skomantai, hill-fort, settlements, micro-region, human activity, non-destructive research methods, ¹⁴C dating, thermoluminescence dating.

Skomantai and Lithuanian hill-forts

Hill-forts, or strongholds, are the most fascinating and visually best-known archaeological monuments in Lithuania. They have been typical in Europe since the Bronze Age, and in the east Baltic region this type of habitation site originates in the second millennium BC (Grigaravičienė 1995, p.27; Kristiansen 2000, pp.154ff, 300ff; Sperling, Luik 2010, p.140ff). In northeast Europe and the Baltic Sea rim, especially in the east Baltic region, hill-forts with wooden castles were in use until the Middle Ages (Zabiela 2005). The importance of these sites increased especially in the first millennium AD, and it is a fact that hill-forts did not lose their importance as central sites until the end of the 14th century AD, when they were burned down in battles with the Livonian or Teutonic orders, or just abandoned after the political situation had changed. Naturally, human activity after changes in environmental and climatic circumstances, different forms of the economy, the influence of internal and external factors, and relations between the hill-fort and the set-

tlements at the foot changed constantly during such a long period of time.

If we look at Lithuania's archaeological monuments, we can see clearly the large number of hill-forts compared to neighbouring countries. In 2004, when the atlas of Lithuania's hill-forts was being compiled, data from around 993 former and existing hill-forts was available, whereas in 2010 the number of actually surviving hill-forts was around 860 (Zabiela 2005, p.7; Zabiela 2008, p.139). According to data from 2010, between 490 and 500 hill-forts are recorded in Latvia, of which 67 of these fascinating sites have been archaeologically investigated to some degree (Jānis Ciglis, personal communication). Only 133 hill-forts are known in Estonia, and archaeological excavations have been conducted at 61 of these (Tõnisson 2008, p.39ff, Fig. 6; Tvauri 2012, p.39, Fig. 7). The number of hill-forts situated in the Kaliningrad region is actually small, around 150 to 160; besides, only ten of these have been excavated (Hollack 1908; Crome 1940, pp.83-154). In Belarus, there might be more than

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1,000 hill-forts; around 200 of which have been excavated¹ (Zabiela 2011, p.56ff).

Consequently, in view of the fact that the country covers 65,300 square kilometres, the concentration of hill-forts in Lithuania is the largest compared to the Baltic Sea region (Fig. 1). Until 2005, a total of 184 hill-forts had been excavated to some degree, for research purposes, or for the purpose of protecting hill-forts that were being destroyed by riverbeds and other anthropogenic or natural factors. Despite the fact that over the past two decades the research has been limited to excavations of collapsing slopes and ramparts, dykes filled with soil and other damaged areas of the monument, during 16 excavation seasons, archaeologists have managed to carry out comprehensive excavations of the entire hill-fort of Šeimyniškieliai (in the Anykščiai district, eastern Lithuania) (Zabiela 2005, p.493).

Since only a few hill-forts have been excavated, we do not have data for the time of the appearance of most of the country's hill-forts; we can estimate the time of their abandonment on the basis of the visible fortifications dating from the final stage. The large number of hill-forts in Lithuania can be explained by the settlement structure of the land; despite changes in this structure, hill-forts nevertheless retained their status as a significant component of habitation sites. There are numerous hill-forts of Brushed Pottery culture (Grigaravičienė 1995, p.237ff, Fig. 142). They are found in the largest numbers in east and southeast Lithuania. Some of the hill-forts of northwest Belarus and southeast Latvia are also related to the times of the existence of Brushed Pottery culture, which covers a period extending from the late second millennium BC to the second or third century or even as late as the fourth or fifth century AD (Egoreichenko 2006, pp.13, 14, 57-59, Figs. 1; 14; Luchtanas 1992, pp.56-79, Figs. 1, 2, 4-6; Grigaravičienė 1995, p.237ff; Vengalis 2009, p.79ff, Fig. 11). Meanwhile, in the western part of Lithuania and in Užnemunė (the trans-Nemunas region), just as in southwest Latvia, early-period hill-forts should be related to early pottery with a fine-grained surface (Table 1) (Grigaravičienė 1995, p.224ff; Vaskis 1996, Figs. 1, 3). Late-period hill-forts dating from the times of the Vikings, the creation of the state and the battles against the Crusaders are quite evenly² distributed across Lithuania. Consequently, there is a clear relationship between hill-forts as centres of power and administration, and the processes of the formation of

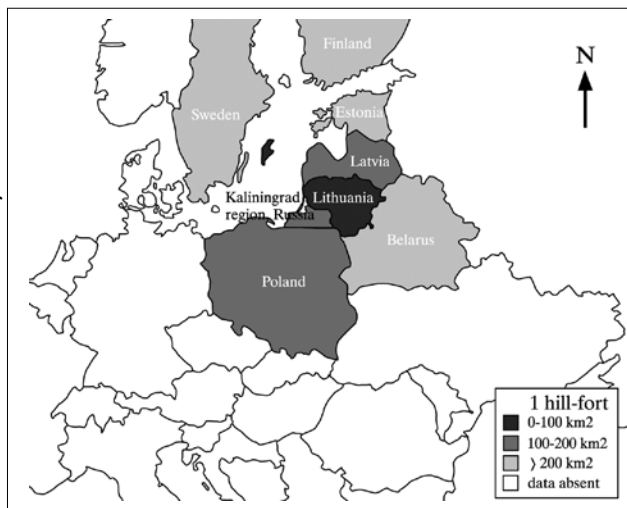


Fig. 1. The distribution of hill-forts in the east (after A. Bliujienė, J. Žikulinas, 2011).

the Lithuanian state. On the other hand, the few brick castles built in the 14th century would not have withstood the continuous onslaught of the Livonian and Teutonic orders. The main advance posts in the battles against the Crusaders were wooden castles built on nearly half of the hill-forts of present-day Lithuania (Zabiela 1995, p.74; Baranauskas 2003, p.58ff, Fig. 1; Kuncevičius 2005, p.40ff). These castles would be repeatedly destroyed by fire during attacks, set on fire by their retreating defenders and, obviously, rebuilt until they were finally destroyed and abandoned in the late 14th and the early 15th century.

Therefore, it is not at all surprising that Jonas Basanavičius (1851–1928), the patriarch of Lithuania's independence and an archaeologist, once said (1970, p.101): 'For the survival of Lithuania to this day, we must be grateful to the strength of our honourable ancestors and our grey-haired hill-forts.'

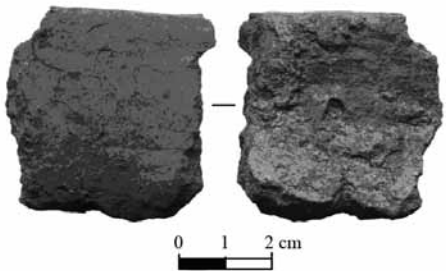
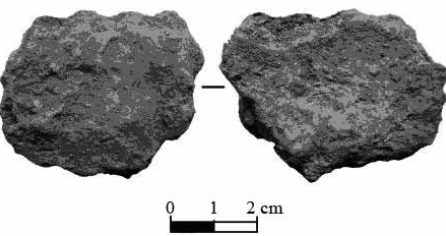
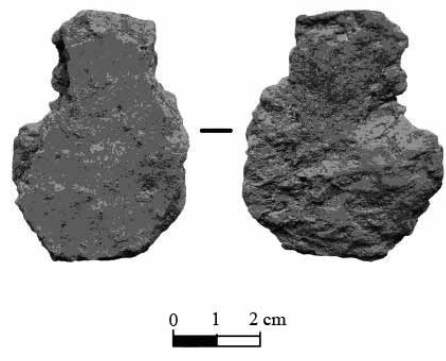
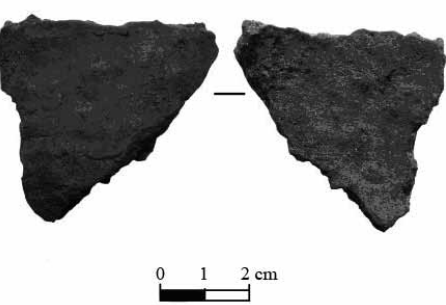
Consequently, it looks as if Lithuania is indeed a land of hill-forts (Fig. 1). The scientists who excavated hill-forts in the late 19th century and those who compiled atlases of hill-forts later (Krzywicki 1906; Tarasenko 1928; LAA, 1975; Baubonis, Zabiela, 2005) noticed this exceptional feature. Furthermore, there exist numerous legends and stories about most of the hill-forts. These legends and stories originated at different times and for different reasons (VAK 1935; Ľapo 2008, p.247ff; Kurila, Vaitkevičius 2011, p.119ff). In the case of Skomantai hill-fort, there are 22 stories (Fig. 2).

Some of them were written down by Ludwik Krzywicki (1859–1941), apparently in 1903 or 1904, when he was excavating the hill-fort; the rest of the stories

¹ Belarus is three times the size of Lithuania.

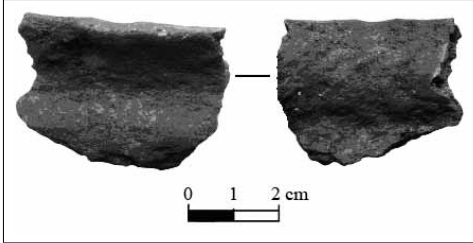
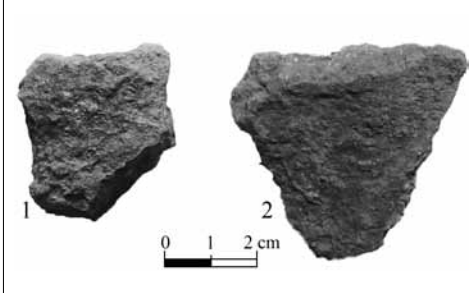
² With the exception of the Semigallian lowland, where only a few hills are suitable for the construction of hill-forts.

Table 1. The chronology of pottery found at Skomantai hill-fort and the foot settlements (Klaipėda district, Lithuania) based on thermoluminescence (TL) and ¹⁴C methods, and archaeological evidence (after J. Kusiak, J. Mažeika and A. Bliujienė).

Potsherds	Characteristic of the dated potsherd	TL dating (yr b2k ^a)	TL dating (AD ^b)	Chronology according to the archaeological evidence
Hill-fort, test pit No 1				
	handmade, with a smooth surface	1637 ± 119	363 ± 119	9–10th c. Type A 3:a (after Žulkus 2007)
	handmade with a rough surface	1164 ± 86	836 ± 86	From the 3rd – 4th to 7th – 8th century AD
	handmade, with a smooth surface	1074 ± 81	926 ± 81	the 1st millennium AD
Western foot settlement				
	handmade, with a smooth surface	1325 ± 96	675 ± 96	The 9 – 10th c.

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	handmade, with a smooth surface	1493 ±105	507 ±105	The 9–10th c. Type A 1:a (after Žulkus 2007)
South-eastern foot settlement, test pit 1				
	handmade with pottery with a grained surface		¹⁴ C dating 60 BC -130 AD	the Early Iron Age/ La Tène Period (after Vasks 1996)

^a TL age (AD) – calendar years calculated as subtraction: AD 2000 – TL age (yr b2k)

^b Walker *et al.* (2009) proposed a notation of age in calendar years before A.D. 2000 (the abbreviation yr b2k) (AD - *Anno Domini*)

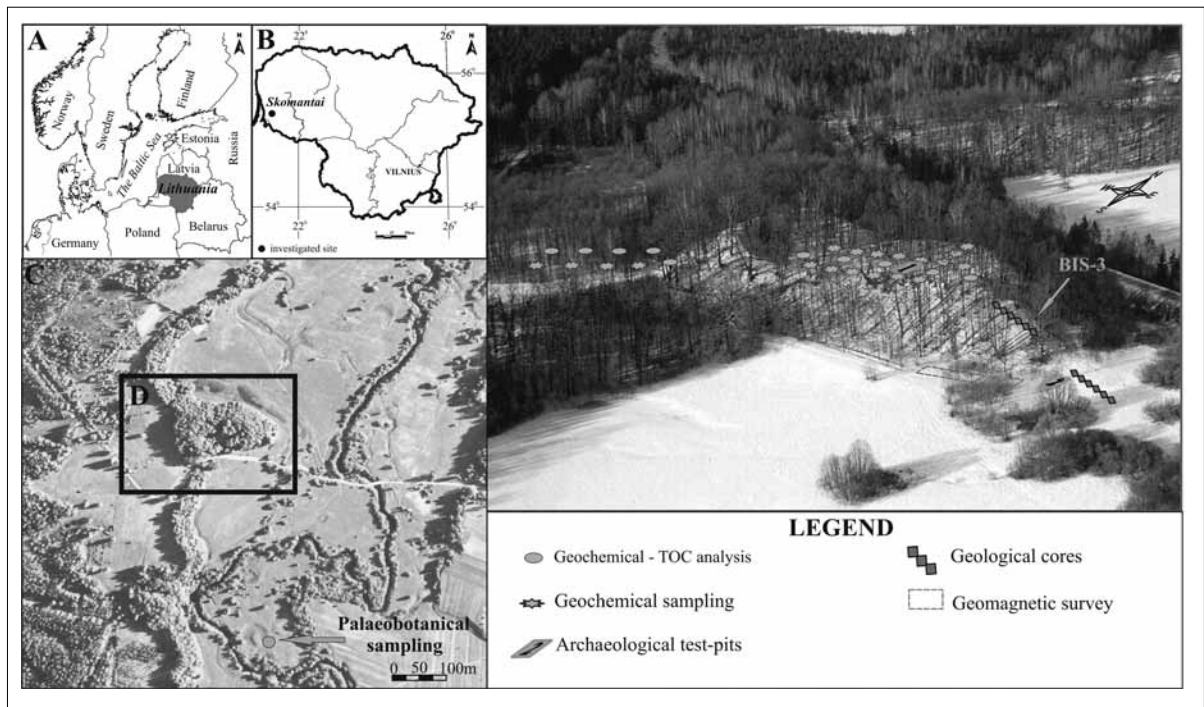


Fig. 2. Lithuania in the context of the Baltic Sea (A); Skomantai hill-fort in the context of Lithuania (B) with sampling places (C, D) (photograph by Z. Baubonis, taken from SE, 2003).

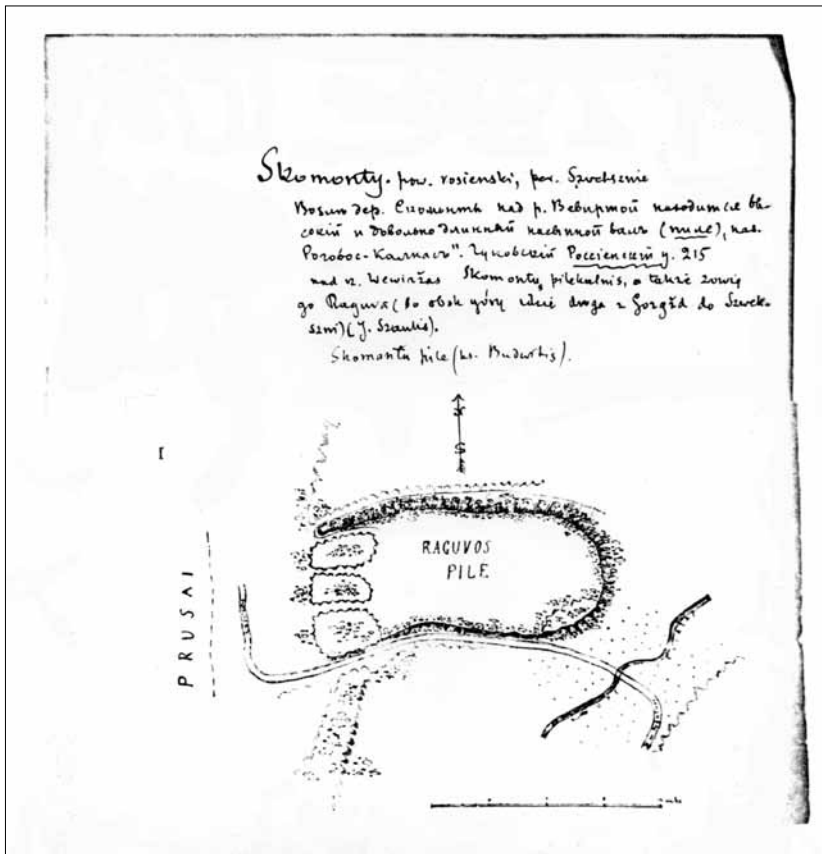


Fig. 3.1. L. Krzywicki's schematic drawing of Skomantai hill-fort (Raguvos pile) and its area, circa 1904.

The text on the drawing reads: 'Skomantai, Raseiniai *pavietas*, Švėkšna commune.

On the bank of the River Veiviržas next to the village of Skomantai is a high and quite long rampart (*pile?*) called "the hill of Raguva". Gukovski [Konstantin Gutovskii, 1857–1906], Raseiniai district [county] 215 (?) [the meaning is not quite clear, a border sign (?)] – Skomantai hill-fort next to the River Veiviržas, also known as Raguva (because the Gargždai–Švėkšna road runs next to the hill) (J. Szaulis [Juozas Šaulys]). Skomantai *pile* (castle) ks. [reverend] Budvytis' (from VDKM, file 468; the language has not been adapted; explanations in square brackets by A. Bliujienė).

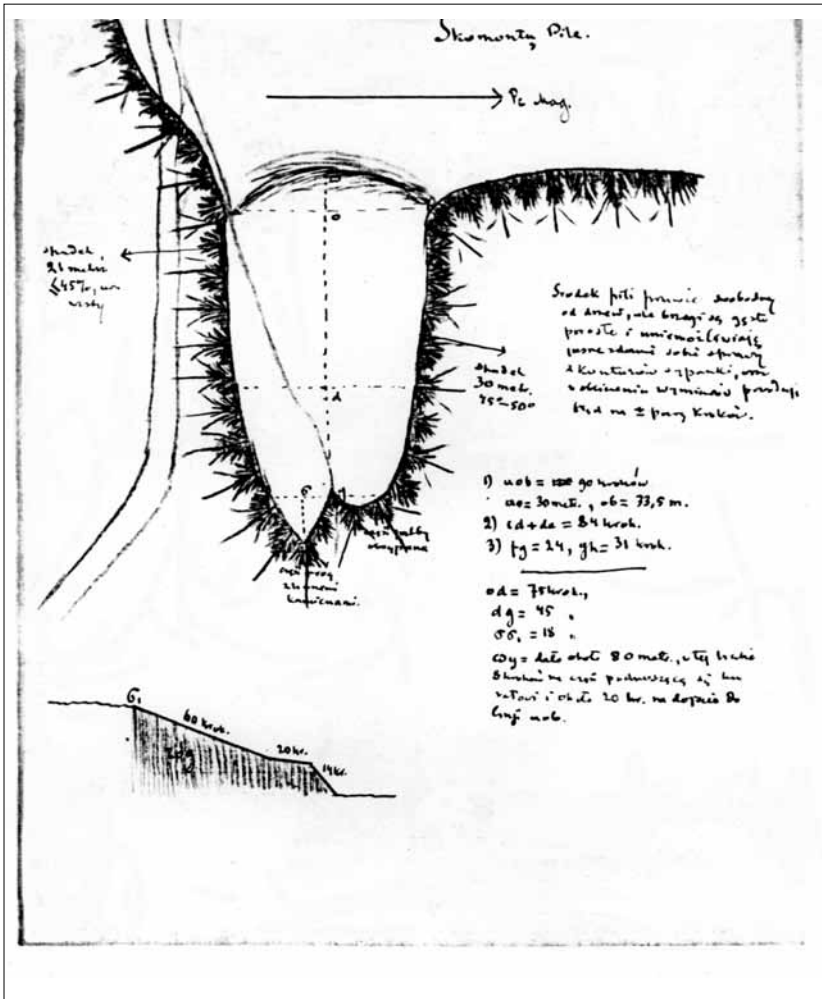


Fig. 3.2. L. Krzywicki's measurements of Skomantai hill-fort plateau, his comments and schematic drawings of the hill-fort profile, circa 1904.

The inscription on the left-hand side of the drawing reads: 'Slope 21 metres, ≤ 45%, steep.'

The inscription on the right-hand side of the drawing reads: 'Slope 30 metres, 45°-50°.'

Explanation: 'The middle part of the hill-fort (*pile*) is almost bare and without trees; the edges, however, are heavily overgrown and it is almost impossible to determine the contours of the hill-fort; for this reason, today's measurements differ by ± several steps.

aob=90 steps
 ao=30 metres, ob=33.5 metres
 cd+da=84 steps
 fg=24, gh=31 steps.
 od=75 steps; dg=45; GG1=18;
 cdy=makes up ca. 80 steps, and along the same line eight steps more when ascending in the direction of the rampart, and around 20 steps to the line aob.

Additional notes: part [galby] piled additionally; part [rog] reinforced with stones?

The diagram of the slope: G1 horn-shaped jut 60 steps, 20 steps, 14 steps' (from VDKM, file 468; the language has not been adapted; explanations in square brackets by A. Bliujienė).

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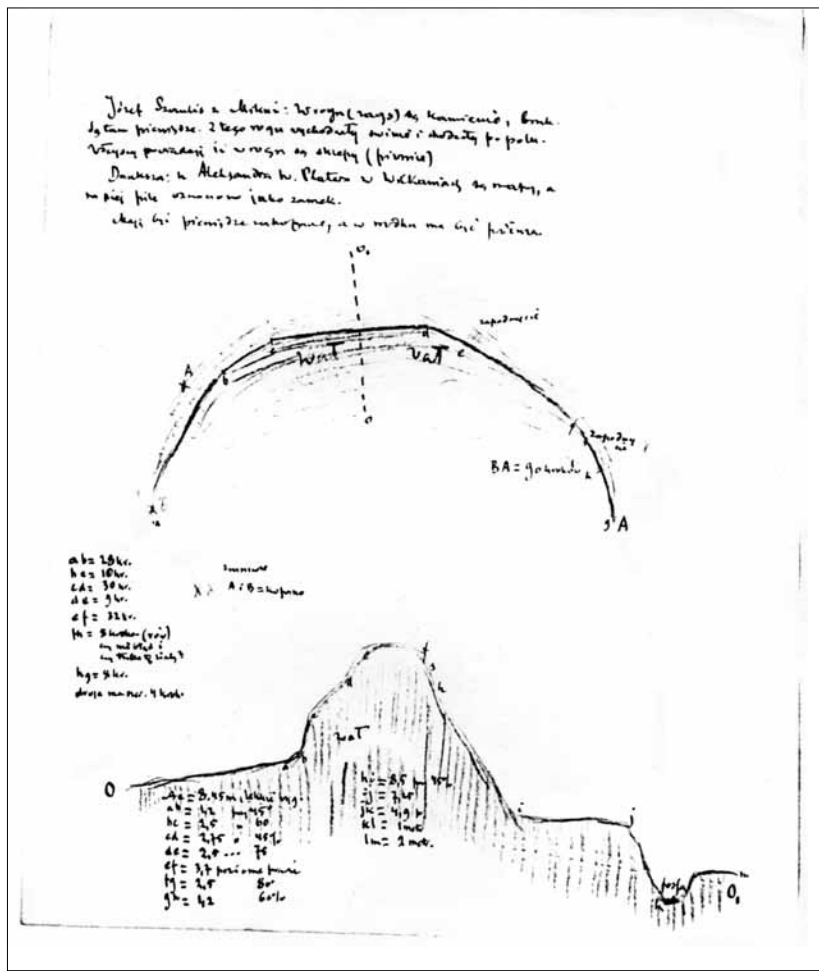


Fig. 3.3. L. Kryzwicki's plan of the fortification system of the west part of Skomantai hill-fort: the ramparts and the ditch, circa 1940. 'Józef Szaulis [Juozas Šaulys] from Mikniai [said the following]: in the horn-shaped jut (rags) [hill-fort, Raguva] there are stones, a pavement. There is money there. From this hut they would let pigs out, and the pigs would forage in the meadow. Everybody says that there are cellars (*sklepa*) in the jut. Dauksza [Daukša] [said the following]: Count Aleksander Plater from Wi[o]lkianiach [Vilkėnas (?), the former manor of the Platers] has a map with a *pilė* [fortified-hill] and a castle marked on it. There must be money buried there, and a cavity inside? The diagram: (top view of the rampart)

Rampart

The inscriptions on the right: Depression, BA=90 steps; A:B=excavated [excavated area] ab=28 steps (kr.: abbreviation for 'steps'); I hc=10 steps; cd=30 steps; de=9 steps; ef=32 steps; fh=8 steps (ditch); hg=8 steps.

The road width should be four steps. The cross-section of the rampart: The rampart; The fossa; Aa=8.45 m, slight elevation. ab=1.45 angle 45°; bc=2.5; 60; cd=2.75; 45%; de=2.5; 75; ef=3.7 slight elevation; fg=2.5 80°; gh=1.2; 60%.³

(from VDKM, file 468; the language has not been adapted; explanations in square brackets by A. Bliujienė).

were recorded in 1985 (VDKM 468; MAB F. 235-287, p.2; Stulpinas, 1985, p.38ff; cf. Baubonis, Zabiela 2009, p.61ff) (Fig. 3.1-3). These stories are told by people living in the neighbouring villages. However, when dividing the recorded stories into groups, it becomes obvious that their storylines are known more or less throughout Lithuania.

At the end of the 19th century, Count Plater, or Count Adam Alfred Gustav Broel-Plater (1836–1909), who owned an estate in the town of Švėkšna, only 12 kilometres from Skomantai, dug a test pit in the western rampart (Baubonis, Zabiela 2009, p.61; Bliujienė 2011, p.39). In 1903 or 1904, Krzywicki excavated one or two test pits beside the southern part of the western rampart. However, he did not publish the results of the small-scale excavations on Skomantai hill-fort (Fig. 4) (Tarasenska 1924–1928, p.2; Baubonis, Zabiela 2005,

p.428; Baubonis, Zabiela 2009, p.61).³ Tarasenska confirmed that one test pit had been excavated, in which a cobblestone pavement and pieces of burnt clay had been found at a depth of 18 centimetres, and then a layer 60 centimetres thick and consisting of pieces of burnt clay mixed with charcoal was uncovered at a depth of 40 centimetres (Fig. 3.3) (Tarasenska 1924–1928, p.2).

Only a few pieces of iron slag and several dozen potsherds were collected during field walking surveys over the last four decades: potsherds with a rough and grainy surface; potsherds with a smooth surface; potsherds of pottery the surface of which is pricked with

³ Krzywicki gave part of his excavation material to the State Archaeological Museum in Warsaw. However, the material from Skomantai hill-fort was not handed over (Iwanowska, 2009; Bitner-Wróblewska, Sobczak 2009).

small holes, therefore, such pots are similar to a strainer; and potsherds of vessels that were made on a slowly rotating wheel (Valatka 2004, p.326;⁴ Salatkienė 2009, p.190; Bliujienė 2011, p.38ff). However, the precise location of these finds is unknown. The pottery collected allows us to date Skomantai hill-fort and its settlements to the period between the first millennium and the 13th century AD (Baubonis, Zabiela 2009, p.66).

The stories that stand out are those about the Samogitians' battles against the Teutonic Order, and about Skomant, the ruler of Skomantai, who was killed while defending the castle, as the storytellers assume. Furthermore, the storytellers insist that Skomant was buried under a stone on this impressive hill-fort (Stulpinas 1985, p.38; Baubonis, Zabiela 2009, p.63ff). Indeed, in his descriptions of the Sudovians' battles against the Teutonic Order, Peter of Dusburg mentions more than once the ruler of the Sudovians, Skomant, Skomand, Scumandus or СКОМОНДЪ,⁵ as he is known in Slavonic chronicles (Dusburg §164, §166, §192, §209, §210-211 and §224).⁶ However, it is impossible to link this person to Skomantai hill-fort.⁷ In this case (just like the stories described in footnote 6), the collective (folk) memory, embellished with the battles of the heroes of the past, reflects the ideas of the national revival and the interest in the history of the country. Meanwhile, the activities of the enlighteners of the 19th century served as an incentive to transfer the deeds of the heroic persons described in historical sources into a definite environment due to the outward similarities. Apparently, this was exactly the case with Skomant and Skomantai. On the other hand, linguists insist that the leader's name and the place-name are related (Gerrullis 1922, p.48; Būga 1959, p.100ff; 1961, p.140ff). Based on Dusburg's chronicles, the chief of the Sudovians who is mentioned in them and Skomantai hill-fort are not related. There are quite a few locations and

hill-forts in Lithuania with names that originated from place-names, such as the neighbouring Jomantai hill-fort and Jurgaičiai burial site. The fact that the name Skomantai originated from a person's name can be supported by the inventory books of the manor and the town of Švėkšna from 1695, which mention beekeepers' services, and the beekeepers Jurgis Skomontaitis, Woyciech Skomont, Elias Skomont (Lebedytė 1985, p.7).

As many as four stories about Skomantai hill-fort mention the Swedes (Scandinavians): their robberies, the way they used to hide their booty, their fighting with the local population, and even the long stay of the Scandinavians. The stories stress the fact that the Swedes used to stay in forests, and not in the castle of Skomantai (VDKM 468; Baubonis, Zabiela 2009, p.61ff).⁸ Although the text of one of the recorded sto-

⁸ Skomantai near Švėkšna is the name of the castle of Skomantai or the castle, the hill-fort [rampart] of Raguva, as explained by T.A. Daukša from Mikniai (?) [Mikuižiai?], to whom the story was told by Antanas Jakubauskas, to whom, in its turn, the story had been told by one of the earl's daughters [?]. When there were no Christians yet, Jurgotina [the sacred place] was situated there; pagans would get together to pray on the mound, and everyone would bring a bag full of soil as an offering, and they would burn oak firewood. That is why they use the form of address 'Jergutėliau' [or Jargutėliau, 'Oh Jesus'] for the name of the god.

H. [Count] Plater became interested in the hill-fort and began excavating it. They excavated in the rampart, where charcoal was found in a shallow pit hole. The priest of Jurgotina stayed by the fire all the time, because if the fire went out, the faith would go out too. There were no Swedes there, they did not live in the castle. The Swedes would arrive by boat and live in the forests; once they stayed there as long as three years. They would summon the Samogitians by blowing wooden pipes; a piper would walk around the village, and everyone had to go; those who did not go would be killed. The priests supervising the fire would move. The storyteller does not know anything about Mockaičiai. He has not heard anything of a cobbled pavement in the water-meadow either; neither does he know any stories about horses [such stories are known from the stories recorded in 1985]. The shrine of Jurgotina was situated in the castle, whereas all the people lived in villages. When someone from Jurgotina had passed away, they would not bury him for a whole week; for the whole week they would treat him like a living person at the table, they would give him a place at the table, and then they would carry him to the burial place and burn him wrapped in straw on an iron [?] bed. A priest would point to a rider on a grey horse riding in the air in order to show [tell] that the soul was ascending into heaven; at the same time, they would cry, and the tears would be collected in tear vessels; then the vessel containing the ashes, as well as the tear vessels, would be placed in the grave ½ (?); the grave would be paved similarly to the circle of a threshing barn. Then they would fill the grave up (with soil). They

⁴ The material from Skomantai kept at the Žemaičių Alka Museum was deposited in the museum around 1950; these items are potsherds with a fine-grained, grained and smooth surface (ŽAM GEK 3978–3984).

⁵ At the end of his life, Skomant apparently could no longer withstand the continuous onslaught by the Order, so at first he and his entire family surrendered to Russia, and then to the Teutonic Order. He died between 1283 and 1285, a Christian, probably in the castle of Balga (Dusburg §212 and §224).

⁶ The dominions of Skomant are mentioned in written sources as being situated around Cresmen (Kresmena com., Poland) around Skometnersee (present-day Lake Skomętno, west of Augustów). A place called Skomatburg, or Skomantas' castle, is known to have existed on the south shore of Lake Skomętno; a village called Skomentberg is situated nearby.

⁷ There are opposing opinions on this issue. For this, see: Źulkus 1989, p.24.

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ries (see footnote 6) has been subjected to literary modification, we can nevertheless discern an information layer containing records of past events in it; this information layer can be supported with material from the Lamata area and Scavlian monuments located southeast of Lamata, in which traces left behind by the Scandinavians are reflected. It is obvious especially from these regions that Scandinavian weapons, household articles and ornaments are known (Kazakevičius 2005, p.25ff, Fig. 2; Budvydas 2007, p.207ff, Figs. 3-8). In Žakainiai hill-fort, situated a mere 17 kilometres south of Skomantai, household articles (a cauldron handle) used by the Vikings have been found (Fedajevas 2006b, p.33). Scandinavian traces are recorded in the names of west Lithuanian and Samogitian hill-forts ('Swedish hills', Schweden-Shanze/Alte Schanze, Schwedenschanze, Swedenberg, 'Swedish roads and fords') and stories about them (Krzywicki 1906, pp.23, 28, 49, 52, 64ff, 70; Łapo 2008, pp.247-281).

Hill-forts could be used for various activities, including rites, after the purpose they were originally intended for had changed, or after they had been abandoned as dwelling sites, or when they had finally lost their defensive function. This claim can to a certain extent be proven by the mentions of the 'shrine of Jurgotina' situated on Skomantai hill-fort. In this story, we can recognise a popular interpretation of various written sources. Consequently, the layers of collective memory, intermixed with romantic stories and preserved to this day, contain 'thick layers of real events', and attempts can be made to verify them on the basis of other sources. The trials and troubles of life in the hill-forts following their abandonment should not be forgotten either. The destiny of Skomantai hill-fort is marked by a certain tragedy: despite the fact that it has remained majestic, it found itself within an area of high anthropogenic activity, that is, in a border area (Fig. 2). The road that ran along the foot of Skomantai hill-fort was called 'the border'; there was a border guard station in the western settlement. When Lithuania regained the Klaipėda region, a forest guard lived there: he tilled the state-owned land allocated to him, that is, part of the

would not drink any wine in the cemetery. They would divide the remaining belongings of the deceased person into three parts; the best belongings would be put closest [handed over to the shrine]. Similarly to the Character by Daukantas [the work by Simonas Daukantas (1793–1864) *Būdas senovės lietuvių, kalnėnų ir žemaičių* (The Character of Lithuanians, Higher and Samogitian, of Old Times)]. The Jurgotiniai lived in Jurgotina (there is such a village nearby) [probably the village of Jurgaičiai, seven kilometres to the south]. The pagans were called Jurgotiniai after the god Jurgotikis [or Jurgotilis] (VDKM 468; the language has not been corrected; comments by A. Bliujienė in square brackets).

western settlement, and dug potato stores in the hill-fort (Stulpinas 1985, pp.36-44). Part of the western settlement was tilled until 1985.⁹ Besides, the hill-fort, an attractive one indeed, was a meeting place for the communities of the surrounding villages. A sculpture symbolising the unification of Lithuania Major and Lithuania Minor was erected on the western rampart in 1928; the area was tidied up (fir trees were planted on the rampart, wooden steps built), and the grounds were levelled. People would dance and make bonfires there on various occasions (Stulpinas 1985, p.41).

Skomantai hill-fort in the context of the micro-region

Skomantai hill-fort is located in the northern part of the historically noted Lamata area (Lammato, Lammata, Lamotin terra). Lamata was first mentioned by Saxo Grammaticus in 1231 (Scriptores 1861, p.737), and around 1294 to 1300 it was noticed by Dusburg (§259). Skomantai stands on the crossroads of routes from the lower reaches of the River Nemunas (Neman) towards the Baltic Sea. Apparently, Skomantai and the archaeological complex of Žardė and Laistai, situated in the environs of present-day Klaipėda, constituted the main points of the transport chain, reached from the River Nemunas, running from the Lamata area to the Baltic coast. On the other hand, the communities of Skomantai and its vicinity had direct access to the Curonian Lagoon and the Baltic Sea, without having to cross their neighbours' lands, by using the rivers Veiviržas and Minija as transport arteries. Also, one branch of an important land route turns to the northeast from the crossroads at which Skomantai stands. Archaeological evidence from Skomantai and the micro-region in general reveals that the Skomantai communities, being situated at an important crossroads and in control of land and water routes, were quite rich in imports, and even imported articles unique to Lithuanian archaeological evidence, such as a Byzantine follis of Emperor Nicephorus II Phocas (963–969). In the historically noted Lamata area, just as in the environs of Skomantai, plenty of hand-held balances and weights have been found, which serve as direct evidence of the importance of trade and handicrafts (Genys 1997, pp.142-150, Figs. 1-3; Bliujienė 2003, p.122ff, Table 1, Fig.1).

Skomantai hill-fort is the most visually impressive stronghold in the region, with its high-powered fortification system (ramparts, deep ditches and forework). Even today, it ranks among the best-fortified defensive

⁹ Fragments of pottery apparently originating from the ploughed west settlement were brought to the LNM and ŽAM.

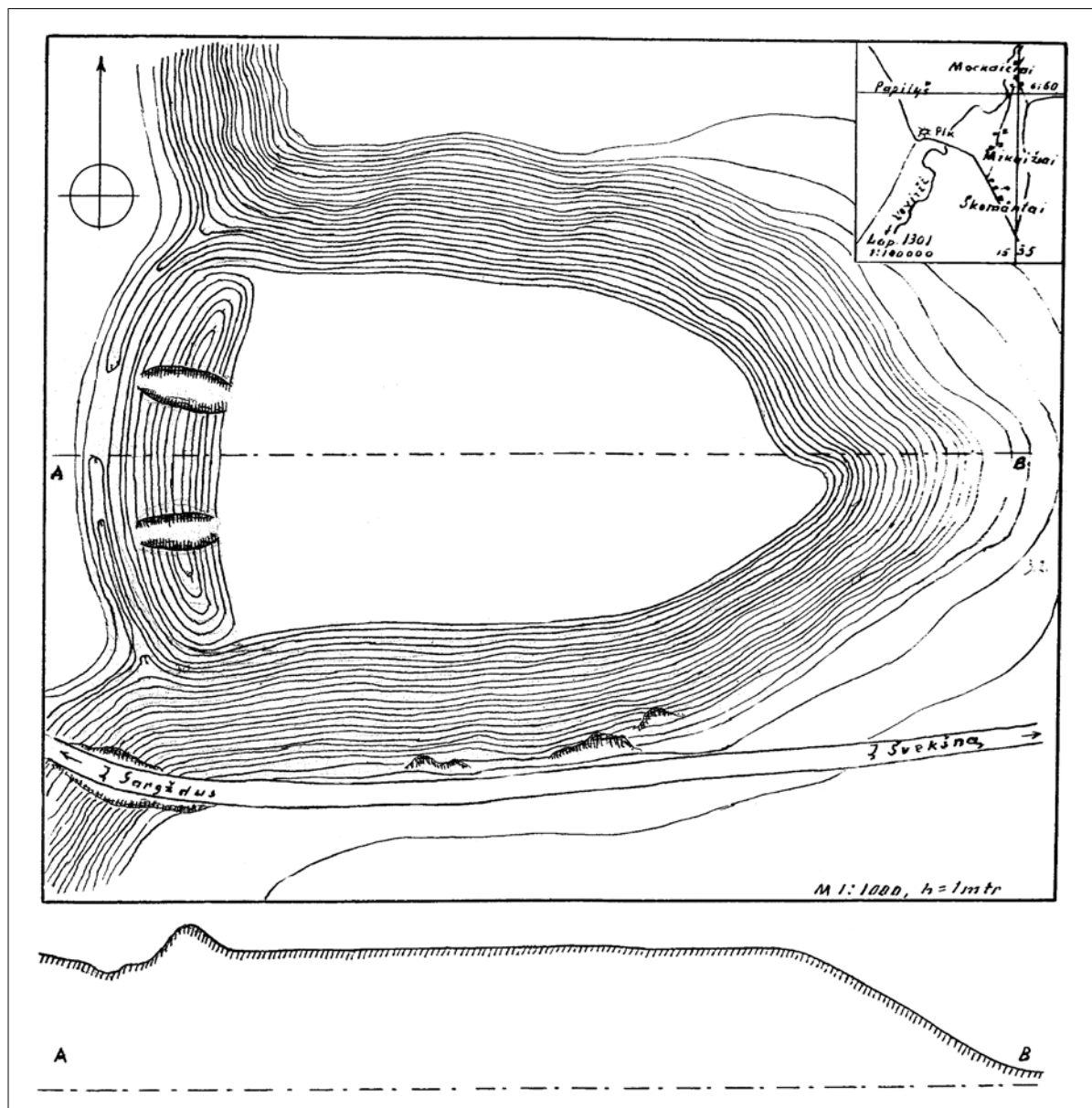


Fig. 4. A plan of Skomantai hill-fort, drawn by P. Tarasenka on the basis of the schematic drawings by L. Krzywicki from 1904 (see Fig. 4.1-3). The plan of the hill-fort is superimposed with a map of Lithuania (sheet 1301) published between 1924 and 1928 (MAB RS, f. 235-287).

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structures in the Lamata area. Furthermore, the hill-fort is surrounded by three satellite sites, that is, burial grounds and a hill-fort situated in close proximity to Skomantai. However, the impressive exterior of the hill-fort and the complex of monuments do not match the very scarce historical and archaeological data about the site itself. Skomantai hill-fort, also known as Ragokalnis, Raguva and Papilys, stands on the right bank of the River Veiviržas; the river's wide valley surrounds the east and southeast flanks of the hill-fort plateau, which indeed looks like a Ragokalnis, or a 'horn-shaped hill' (Figs. 2; 3.1; 4; Plate VII.1).¹⁰

Just like any other hill-fort, Skomantai and its importance can only be comprehended within a certain context, that is, in its relationship with the surrounding monuments (settlements, burial grounds, zones of economic activity and raw materials, a local sacred place), and in the context of a micro-region that included several groups of monuments. A micro-region is understood as a unit bound by economic and administrative ties, the existence of which (the unit) can be based on statistical methods offered by the paradigm of micro-regions and regions (Thurston, Salisbury 2009). In the second half of the 19th century, when people became interested in the distribution and history of Skomantai and the neighbouring villages in the middle reaches of the River Veiviržas, it became obvious that 'there was a hill-fort in every single village' (Krzywicki 1906, p.57). In other words, there is an exceptionally high concentration of hill-forts and other monuments. There are six hill-forts and six burial grounds known on the banks of the River Veiviržas; there is also a sacred site in the forest close to Šiupariai hill-fort (Plate VII.1). The monuments in the region are not only arranged in compact groups a certain distance from each other, but they are also situated exclusively on the banks of the rivers Veiviržas, Šalpė and Ašva. Meanwhile, in the area surrounded by river bends and further from the banks, there are no known archaeological monuments, nor have individual finds been found there. Two assumptions can be made regarding the distribution of

¹⁰ During his excavations in Skomantai hill-fort in 1903 or 1904, Krzywicki measured the hill-fort and drew several schematic plans of it and its environs with explanations (VDKM, b. b. 468 and 469). At the same time, he visited the hill-fort of Mockaičiai (Šiūraičiai), and apparently also measured and described this hill-fort. When preparing his work 'Archaeological Material of Lithuania', P. Tarasenko (1892–1962) redrew these plans and added, for the sake of guidance, details from the map of Lithuania (the publication of which began in 1924) relating to the neighbouring locations (Figs. 4; 5) (MAB, f. 235-287; 235-184). Regrettably, Krzywicki never published the results of his excavations, and the material prepared by Tarasenko was not used in the published atlas of monuments.

the monuments. They are distributed in this way because of the natural conditions: the wet¹¹ and wooded Samogitian moraine lowland (even today, there is the large marshy Šiūraičiai forest, as well as the Bilvietis forest)¹² is hardly suitable for crops or pasture. However, the dense habitation of the micro-region, palynological analysis and research into the environment suggest that since time immemorial people have found a livelihood here, that is, in the tilled fields and meadows. The micro-region surrounded (and in a way protected) by the rivers might extend for approximately eight kilometres in an east-west direction, and nine kilometres in a north-south direction. Consequently, its estimated area might be approximately 72 square kilometres. According to this theoretical model developed on micro-regions, the maximum extent of the area might cover no more than a six to ten-kilometre radius from the centre; the maximum extent of the area might cover from 100 to 300 square kilometres. The minimum extent of a micro-region in an agrarian society theoretically depended on the soil and the farming methods: these issues predetermined whether the inhabitants were able to administer the formal micro-region (Kuncevičius *et al.* 2011, p.14ff).

Although the Lamata area cannot be defined precisely, based on the distribution of monuments, the total area of the land might be estimated at 100 to 500 square kilometres, in which a total of six micro-regions of varying sizes can be identified. These micro-regions correspond to the castle districts (*Borchukunge*) known from written sources (Žulkus 1989, p.21ff; 2004, pp.44-45). Theoretically, in the Skomantai micro-region, every hill-fort and its settlement would have been in possession of around nine to 10.5 square kilometres of land intended for economic activity (ploughed fields, meadows, forest, swamps).¹³ However, as research into other west Lithuanian monuments from the first millennium indicates, fords across rivers next to monuments transfer their economic activities to the other bank of the river, and thus the land area used for economic activity increases.

¹¹ For this, see the chapter 'Palynological investigations'.

¹² There are more than ten tributaries of the rivers Veiviržas, Šalpė and Ašva in the micro-region. These include the Sveisna/Švėkšnalė, mentioned in the Order's road descriptions dating from 1384. In 1387, this river was mentioned as Swexte. Consequently, the Švėkšnalė/Švėkšta (a right tributary of the River Ašva), the Veiviržas and other rivers of west Lithuania are mentioned in the Order's road descriptions.

¹³ This estimation is close to the theoretical model whereby one habitation in the Lamata area should have had in its possession on average 12 to 19 square kilometres (Žulkus 1989, p.23; 2004, p.45).

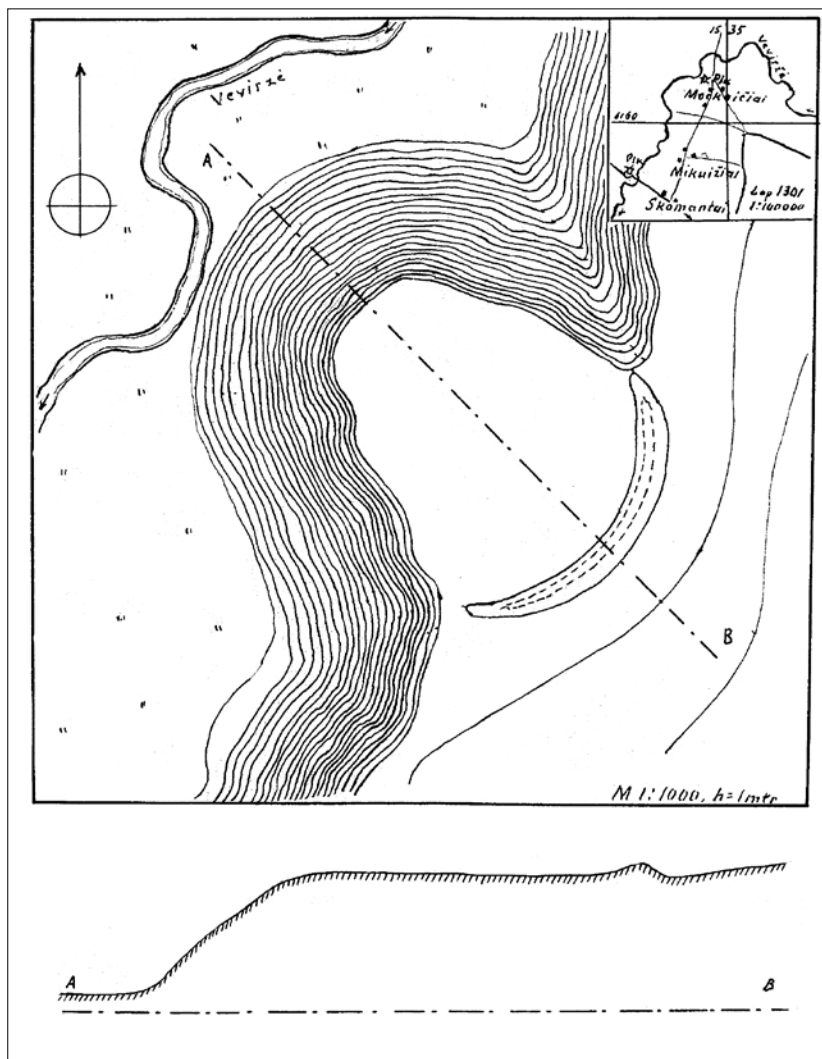


Fig. 5a. A plan of Mockaičiai (Šiūraičiai) hill-fort, drawn by P. Tarasenko based on the plan compiled by L. Krzywicki in 1904. Superimposed with a map of Lithuania (sheet 1301) published between 1924 and 1928 (MAB RS, f. 235-184).



Fig. 5b. Mockaičiai hill-fort rampart from southeastern side in 2004. Photograph by Z. Baubonis.

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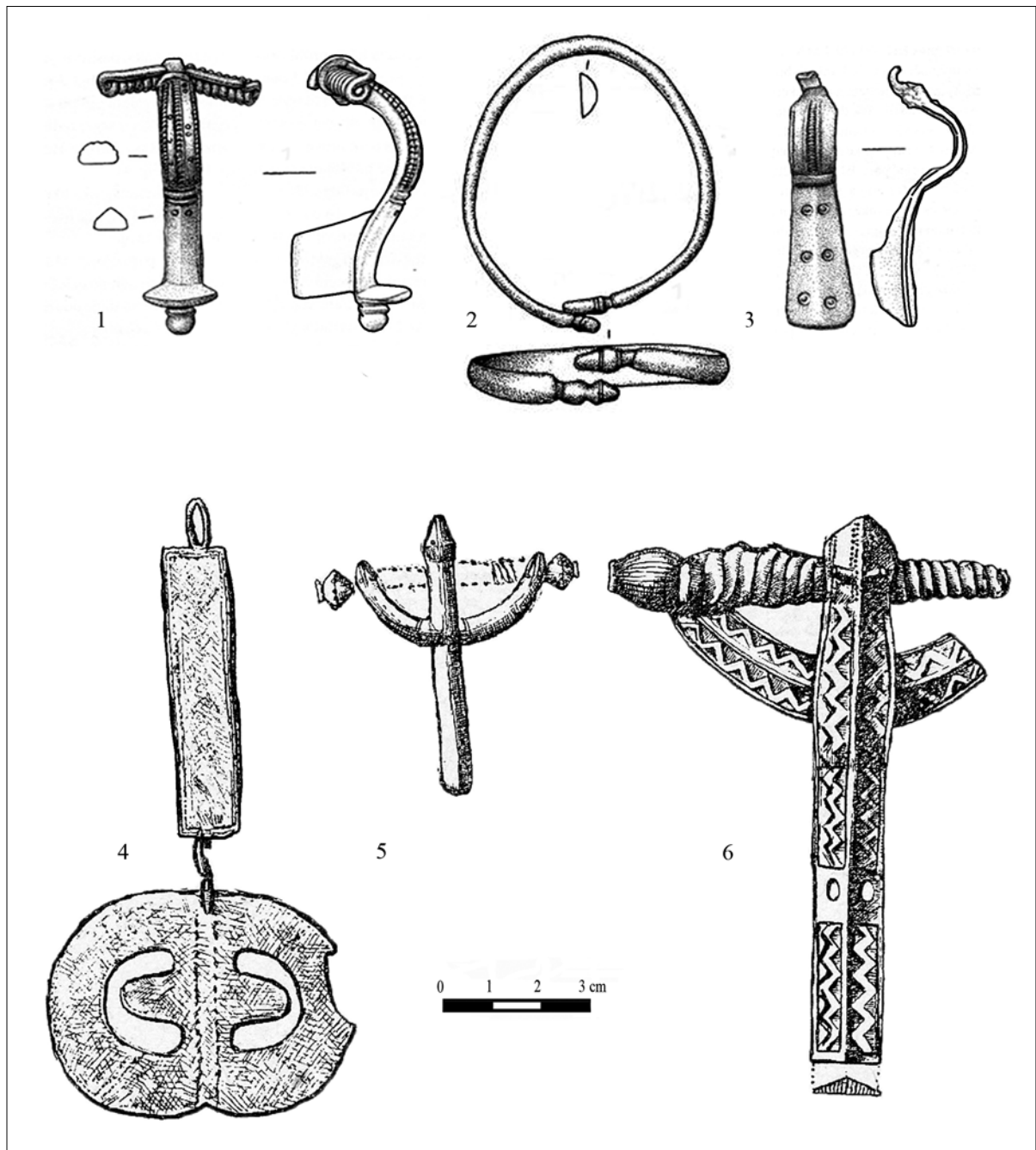


Fig. 6. Bronze jewellery found in Mikužiai Roman Iron Age (1-3) and Mockaičiai Late Migration Period (4-6) burial grounds (1-3 after Michelbertas 2005, Figs. 4.1, 4; 6.1; 4-6 after Nagevičius 1935a, p.69).

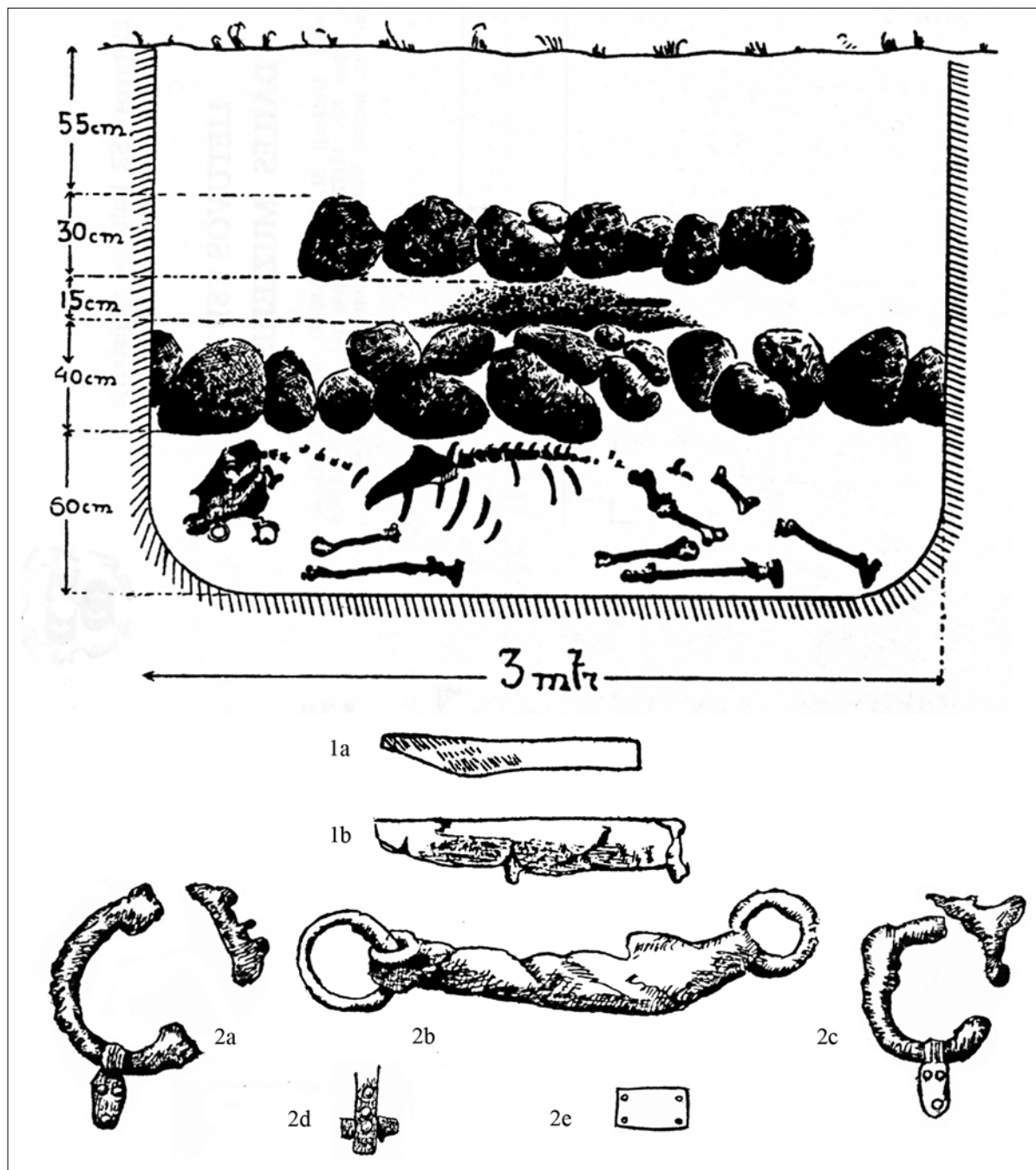


Fig. 7. A horse and man cremation grave from Skomantai burial ground dated to the tenth or 11th century: 1 a-b a knife with fragments of bronze scabbards found in the man's grave; 2 bronze and iron fragments of a horse harness (Nagevičius 1935b, p.70ff).

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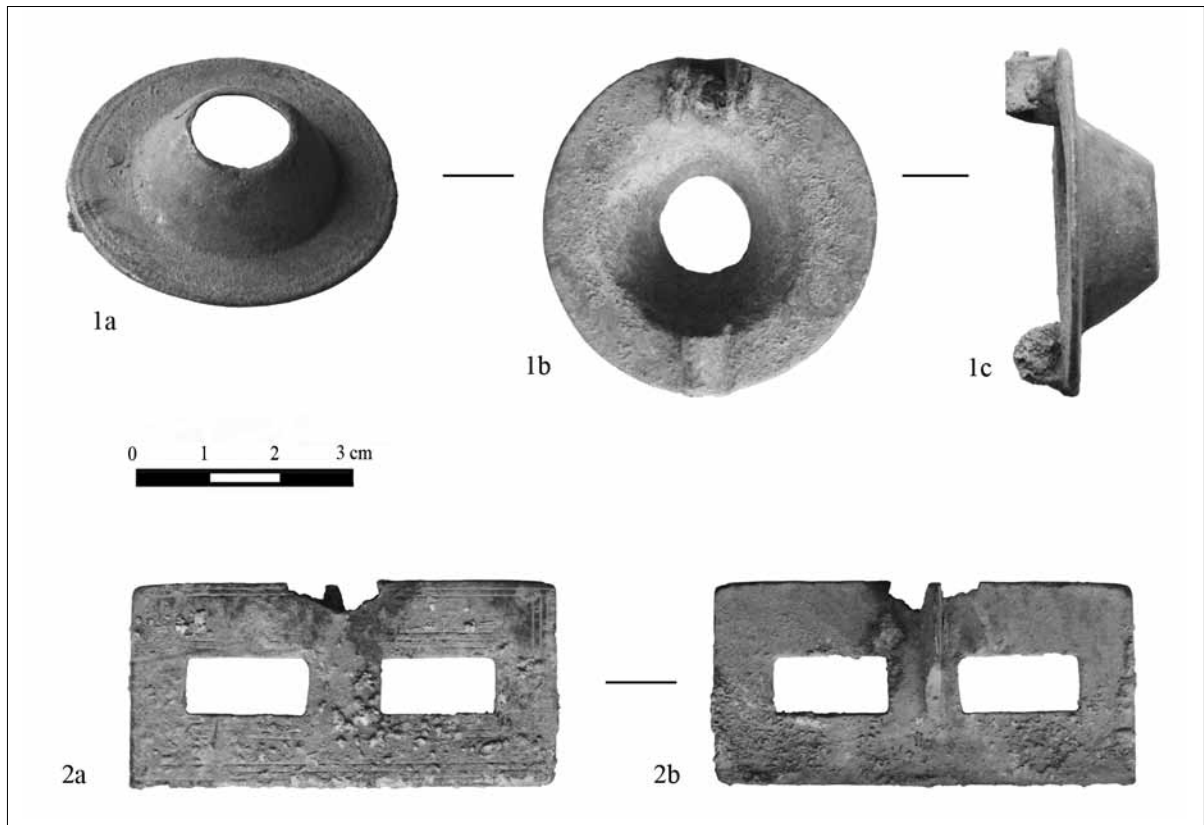


Fig. 8. Bronze fibulae dated to the 11th century (2) and the first half of the 13th century (1) found in Mockaičiai burial ground, stray finds (photograph by D. Butkus, KM GEK 2798: 1-2).

The spatial distribution of sites in the micro-region might show a hierarchy between the sites in the landscape and the subdivision of the space between neighbouring hill-forts. Skomantai hill-fort, with its fascinating visual presence, is dominant in the surroundings (the micro-region). Meanwhile, Mockaičiai (Šiūraičiai) hill-fort, situated at a distance of 2.1 kilometres northeast of Skomantai, is the direct opposite of it (Fig. 5). Therefore, it is important to understand the internal relationships between Skomantai hill-fort and the outer settlements, as well as the external monuments' ties with the closest sites. One story about Skomantai hill-fort claims that the hill-forts of Skomantai and Mockaičiai were connected by a cobblestone pavement, or a road (Baubonis, Zabiela 2009, p.64ff). Mockaičiai (Šiūraičiai) hill-fort is the direct opposite of Skomantai, in the currently visible arrangement of its fortifications, the rampart and the ditch. The hill-fort is surrounded by a high half-rounded rampart, only one metre high, and a shallow external ditch, which separated the site from the wide open space of the lowland.

Some of Lithuania's hill-forts did not have extensive fortifications. This is noted in written sources from the Order's times, which make a clear distinction between *castrum/castra* and *propugnacula*,¹⁴ a fortified castle and a protective castle/fortification respectively (Dusburg §7; 252, 254, 271, etc). *Propugnacula*, or hill-forts with minimal fortifications (or at least parts) might have been called *pilikės* (small castles), *pabūtkalnai* (short-stay hills), *'boby' kalnai* ('women's' hills), surveillance castles or guard hills. As the names show, there are slight differences between the fortifications. Some of them could have been used for a short stay, for instance, women and children could have hidden in them in danger. The functions of other hills included surveillance (outposts, guard hills, small castles), and the timely notification of danger (fire smoke, known as 'brushwood burning'); they could also serve as temporary shelters (Krzywicki 1906, pp.26-38, 56, 60; Nezabitauskas 1968, p.8). Consequently, recorded names clearly indicate different roles of the hill-forts, within both the archaeological complex and the micro-region. For this reason, the collective might have preserved the former habitation structure. However, it is

¹⁴ In Latin, *prōpūgnāculum*, protection, fortress; *prōpūgnātio*, defence.

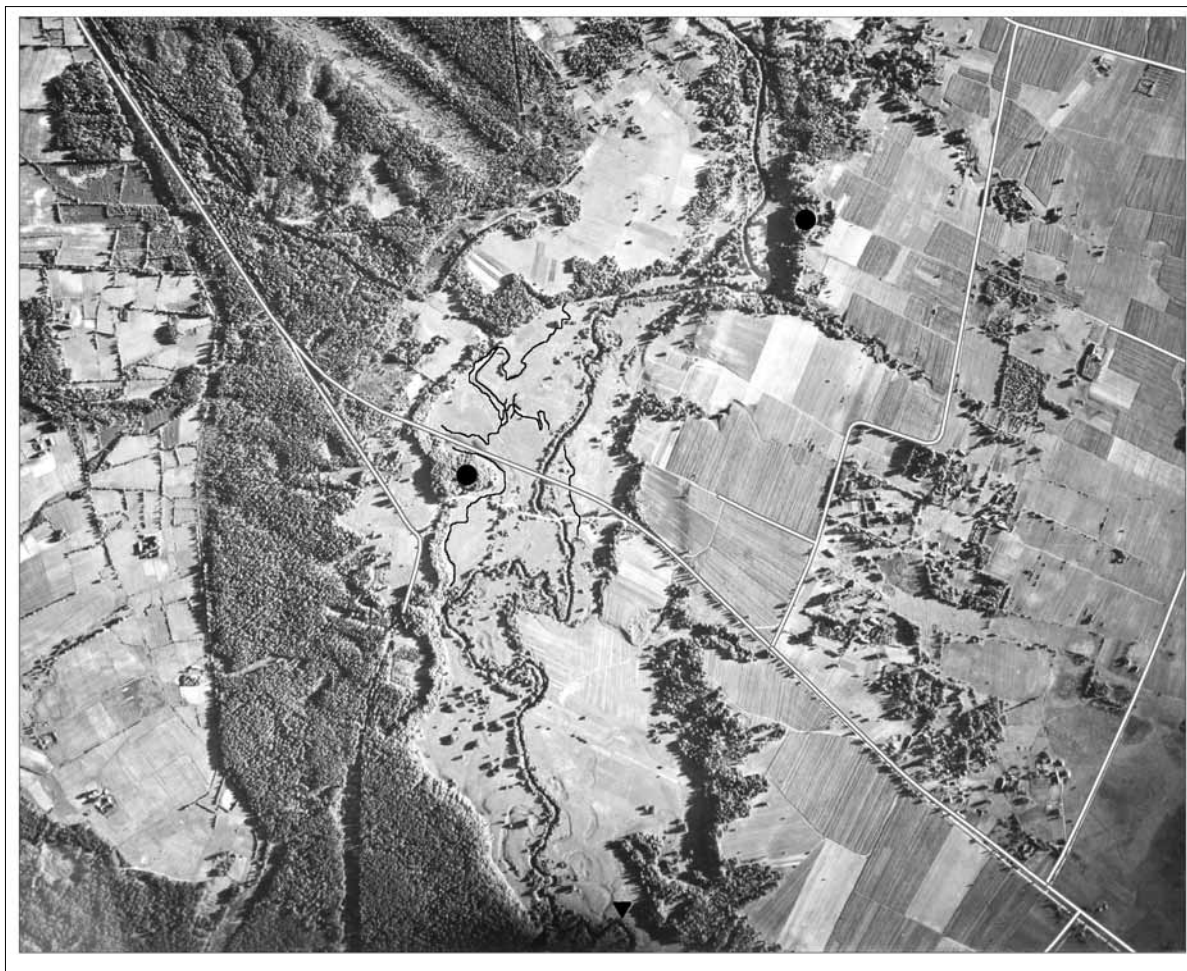


Fig. 9. The valley of the River Veiviržas at Skomantai hill-fort in 1958 (photographs from the National Land Service under the Ministry of Agriculture).

difficult to give a single answer to the question as to how the collective memory relates to written sources, and how much knowledge has been taken from these sources and found its way into folklore.¹⁵ Although there is no information whether Mockaičiai (Šiūraičiai) hill-fort might have been called a *pabūtkalnis* (a short-stay hill), it seems that it had distinctly different functions to Skomantai, and was just a hiding place for the local community and property during outbreaks of tribal and inter-tribal conflicts.

Skomantai hill-fort, with two settlements at the foot of the hill, not only dominates the landscape visually. Three burial grounds can be added to the complex (Plate VII.1). This means that Skomantai hill-fort is therefore surrounded by the largest number of burial monuments in the micro-region. However, none of these have been excavated much (Nagevičius 1935b, p.70ff; Bliujiėnė

1989; Michelbertas 2005, p.109).¹⁶ Nevertheless, the excavated graves and individual finds might serve as an indication of the fact that people were continuously buried in the burial grounds from the second half of the first century until the first half of the 13th century (Figs. 6; 7; 8). Therefore, it is quite plausible that Skomantai was continuously used as a habitation site; the perforated pottery and the smooth-surface pottery found in the Mikužiai burial grounds typologically match the pottery found in Skomantai hill-fort, whereas chronologically both potsherds might belong to the Roman Iron Age (Michelbertas 2005, Fig. 9).¹⁷

¹⁶ In 1909, Vladas Nagevičius (1880–1954) excavated three graves of burnt bodies in the Skomantai burial grounds situated at a distance of 500 metres north of the hill-fort. P. Tarasenko tried to excavate Papilijai burial grounds (next to the village cemetery) in 1925, and he excavated one grave (?); in the Mikužiai burial grounds, situated on a hill at the confluence of the rivers Veiviržas and Kuisis, the remains of one inhumation grave and dozens of accidental finds were found (Figs. 6.1-3; 7).

¹⁷ Stored in the Lithuanian National Museum (LNM GRN 34947).

¹⁵ For instance, the manuscript by Nezabitauskas quoted for the most part relates the knowledge mentioned by written sources (Dusburg; Scriptores) to stories about Samogitian hill-forts written down by Krzywicki. The author neither quotes sources and literature nor indicates who supplied him with the information (Nezabitauskas 1968).

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Table 2. Skomantai site and its environs ¹⁴C dates

Position in the site	Depth (cm)	¹⁴ C age (yr BP)	Calibrated age (1σ range)	Lab. code	Dated material
Test pit 2	50	290±60	1490-1600 AD	Vs-2143	Organic material, charcoal from cultural layer
	70	1970±80	50 BC-130 AD	Vs-2147	
The main core	180-182	760±30	1240-1280AD	Poz-45827	Sand with organics
Borehole BIS-3	100-112	3990±140	2680-2290 BC	Vs-2148	Sand with organics
	120-130	2190±170	410 BC-10 AD	Vs-2151	
	130-132	1560±280	130-710 AD	Vs-2155	
River Veiviržas channel	water level	1530±40	530-590 AD (40.8%) 440-490 AD (27.5%)	Vs-2135	Wood
		1640±55	340-440 AD (49.1%) 480-530 AD (19.1%)	Vs-2139	

Table 3. The activity concentrations of natural radioisotopes, values of dose rate (DR), correction for supralinearity (I), archaeological dose (AD), and TL age of pottery from the Skomantai site (after J. Kusiak)

No.	Sample No. Lub	⁴⁰ K (Bq/kg)	²³⁸ U (Bq/kg)	²³² Th (Bq/kg)	DR (Gy/ka)	I (Gy)	AD (Gy)	TL age ^d (yr b2k) ^b	TL age ^d (A.D.) ^c
1	4932	502±18	42.5±2.0	48.7±1.9	3.41±0.17	0.6	5.62±0.31	1637±119	363±119
2	4933	827±25	54.9±2.3	61.2±2.2	4.74±0.22	0.8	5.57±0.33	1164±86	836±86
3	4934	678±25	51.2±2.2	53.5±2.1	4.14±0.17	0	4.49±0.26	1074±81	926±81
4	4935	616±22	40.1±2.1	48.6±2.1	3.68±0.16	0.4	4.92±0.29	1325±96	675±96
5	4936	512±19	44.4±2.0	46.8±1.9	3.49±0.16	0.4	5.25±0.32	1493±105	507±105

^a component derived from gamma (γ) radiation

^b Walker et al. (2009) proposed a notation of age in calendar years before 2000 AD (the abbreviation yr b2k)

^c TL age (AD) – calendar years calculated as subtraction: 2000 AD – TL age (yr b2k)

^d confidence interval is expressed in calendar years

Consequently, on an assessment of what has been said of Skomantai hill-fort and the settlements, as well as its surroundings and position in the micro-region and the Lamata area (the hill-fort is encircled by less fortified hill-forts or ‘short-stay hills’ [*pabūtkalniai*]),¹⁸ we can claim that this hill-fort, due to its geographical position and importance in terms of communications, as well as its economic, trading and administrative significance (imported artefacts, individual coins and hoards, attributes of trade) and, apparently, due to its political and ideological significance, almost ideally matches the theoretical ‘central place’ model (Renfrew, Bath 2000, pp.159, 174ff; Näsman 2011, pp.185-192, Fig. 1). ‘Central place’ as a theoretical model of resettlement in the east Baltic region might be compared to the ‘power centre’ model (Lang 2002, pp.18-25; Simniškytė 2005, p.43).

During the last stage in their development, Skomantai and the wooden castle situated on it, along with

¹⁸ Beside Mockaičiai (Šiūraičiai) hill-fort are the hill-forts of Uokšiai and Lekiai.

other wooden castles erected on the banks of the rivers Veiviržas, Šalpė, Ašva and Tenenis, did not serve as individual defensive units, but constituted parts of the integral defensive system of the Lamata area. The descriptions of Lithuania’s roads compiled by the Teutonic Order at the end of the 14th century on the basis of scouts’ reports mention the rivers Veiviržas and Sveisna/Swexte/Švėkšnalė, which the Crusaders had to cross during their march from Klaipėda to Medenicken/Medeniken/Medininkai (Dusburg §320; Scriptorum 1863, p.664). As was mentioned earlier (see footnote 10), the source of the River Švėkšnalė is situated in the vicinity of the present-day villages of Skomantai and Mikužiai. On the basis of this written source, we can draw two conclusions concerning the micro-region discussed in the present article. Firstly, the road is mentioned as a good one, compared with those described further on. This might indicate that both in the Lamata area and in the micro-region, an infrastructure with a certain level of a network of settlements was created. When marching along this road, the Crusaders could

not avoid a clash with the defenders from Skomantai castle and the entire castle region. The bad news is that once Skomantai castle was not mentioned, although it ought to have been mentioned. Therefore, we have to draw the conclusion that by the end of the 14th century the castle had already been burnt down or abandoned. Consequently, Skomantai and its wooden castle might have existed until at least the middle of the 14th century.

A reconstruction of the palaeoenvironment

From the orographic point of view, the Skomantai complex is situated on the border between the coastal lowland and the Samogitian upland. In terms of geomorphology, it is situated between two different formations, the west Samogitian moraine plain, and the southwest Samogitian plain (Guobytė 2002, p.33). Most likely, the presence of natural landscape features in the area was the reason why, following the Treaty of Melno in 1422, which formalised the outcome of the Battle of Grünwald, the border between the Teutonic Order and the Grand Duchy of Lithuania was drawn here. This way, Skomantai hill-fort and the settlements found themselves on the border between the Order and the Grand Duchy of Lithuania, then between Prussia and the Polish-Lithuanian Commonwealth, and finally between Prussia and Russia. The road running by the foot of the hill-fort was called ‘the border’. A border post marked on all maps from the late 19th century was located in the western settlement. In 2011, nine boreholes were drilled in the southern foot of the hill-fort, which clearly indicated the presence of an old riverbed at a depth of 3.5 metres. An analysis of aerial photographs of the valley of the River Veiviržas taken in 1952 and 1958 clearly indicates the presence of old riverbeds (Figs. 2C; 9). For this reason, during the complex excavations of Skomantai hill-fort and the surrounding area in 2010 and 2011, previously recorded stories were taken into account;¹⁹ the present-day riverbed was superimposed with the riverbed marked on a map dating from 1860 by employing a geographical information system (GIS). No significant changes in the riverbed were found. However, in all the maps compiled between the second half of the 19th century and the 1920s, the road called ‘the border’ was marked as running along the southern foot of the hill-fort.

¹⁹ The riverbed of the River Veiviržas changes its path quite often, and during flooding the water at the hill-fort rises 0.5 to one metre. People tell of having seen a hand rising out of the water, or candles floating in flooded meadows (Stulpinas 1985, pp.37-43).

Therefore, prior to the commencement of road straightening works in 1958, the Skomantai–Pėžaičiai gravel road was moved to the north side of the hill-fort, and this was the most significant factor that changed the environment of the monument (Fig. 9). Bog formation processes began in the close vicinity of the hill-fort.

Skomantai hill-fort

The plateau of Skomantai hill-fort is east-west orientated, oblong, trapezium-shaped reaching a size of about 80 by 57 metres (LKS: N6161195,62; E343521,51 WGS: N55°33'37.9"; E21°31'09.6"). The height difference between the plateau and the river is approximately 20 to 22 metres; the slopes are slightly eroded, but still steep. The River Veiviržas used to flow fairly close to the plateau base, as old riverbeds have been recorded here (Fig. 2C). Even now, the main western rampart of the hill-fort is 60 metres long, eight metres high, and 20 metres wide at its base. The stronghold has two more ramparts, and two external ditches over the western one. Meanwhile, in the eastern part of the monument, the rampart accompanying the stronghold and the preceding external ditch are not so impressive. The western foot settlement is located beyond the western rampart, covering about one hectare. One more settlement is located at the southeast foot of the hill, on the bank of the old riverbed of the River Veiviržas.

Methods

Sampling

Using a ‘Russian’ sampler, sediments for the pollen and ¹⁴C dating were taken from the core (190 centimetres deep) drilled in the oxbow lake of the River Veiviržas, at about 650 metres south of the hill-fort (Figs. 2C; 9). Sediments were sampled at two-centimetre intervals for pollen and a ¹⁴C (AMS) survey.

The small-scale archaeological investigations included a survey of two test pits (Fig. 2D). Alongside a lithological description of the sediments, two bulk samples (covering up to five centimetres) were taken for the chronological investigations (conventional ¹⁴C dating) of the cultural layers identified in test-pit No 2. Three potsherds from Skomantai hill-fort and two representing the west settlement were selected for chronological analysis based on the results of thermoluminescence (TL) dating (Tables 1; 3). The chronology of the pot-

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sherd representing the southeast settlement is based on the results of ^{14}C data (Tables 1; 3).

In order to investigate the sedimentological processes and lithological composition of the hill-fort slope, two series of boreholes (BIS-2 and BIS-3), consisting of six and seven cores, were drilled on the northeast slope of the hill-fort (Fig. 2D). The discovered sediment layers were described in terms of thickness, colour and lithological composition. The BIS-3 core was chosen for a detailed geochemical survey, and a set of bulk samples representing the upper part of the core (two metres) and two samples (2.4 and 3.2 metres) from the bottom part were collected. Three samples were taken for conventional ^{14}C dating.

In evaluating the distribution of the cultural layer and collecting samples for the geochemical analysis, total carbon (TC) and carbonate-free residue (TOC) measurements, 28 cores up to 278 centimetres deep were drilled on the hill-fort plateau (19) and within the area of the western settlement (9) (Fig. 2D). A set of three samples representing the soil layer, cultural deposits and *in situ* bed were taken from each spot for the survey. Following the same scheme, samples for a geochemical survey were also taken from the wall of test-pit No 1. To adjust for local background values, four cores were drilled at a 0.5 to one-kilometre distance from the hill-fort, where 16 samples were collected.

In order to investigate the history of the River Veiviržas valley, two samples of wood discovered at the bottom of the river were taken for ^{14}C dating.

Archaeological survey

In 2010 and 2011, two test-pits were excavated in the site. Test pit No 1 (100 by 1.1 metres, up to 70 centimetres deep) was excavated on the Skomantai hill-fort plateau, and No 2 in the southeast settlement (one metre by two, up to 85 centimetres deep) (Fig. 2D). The cultural layer was excavated following conventional approaches. The distribution of the cultural layer was established by summarising the information obtained from the test pits and the above-mentioned cores. The chronological attribution of the cultural strata was specified on the basis of the potsherds discovered, as well as the results of radiocarbon (^{14}C) and thermoluminescence (TL) data.

Geomagnetic investigations

The geomagnetic survey was carried out using a multichannel-magnetometer from Sensorik & Systemtech-

nologie GmbH (SENSYS). The system consists of five fluxgate vertical gradiometer magnetometers (Förster probes, Type FGM-650A) from SENSYS; the channel spacing was 25 centimetres. Because of the local conditions, only three small measurement patches (MP), Nos 1-3, on the hill-fort plateau could be surveyed, two MPs, Nos 4-5, were investigated in the southeast settlement (Fig. 2D). The total area of the geomagnetic survey was 977.32 square metres. The calibration of these MPs was carried out by a total station in a local coordinate system (lower left point x: 2000, y 1000); the corner points were then recorded in the coordinate system LKS 94 (EPSG 3346). The raw data was processed with MAGNETO® software by SENSYS, and with the GIS-software GvSIG.

Radiocarbon (^{14}C) and thermoluminescence (TL) dating

For the radiocarbon (^{14}C) dating, surviving bulk organic carbon was used for benzene production after the physical and chemical pretreatment of the sediments. Benzene output for most samples was 0.5 to one gram, for wood samples as much as two to five grams. Samples with benzene output of less than 0.1 gram were rejected. The specific activity of ^{14}C in benzene was measured by liquid scintillation counting (LSC), as described in Gupta and Polach (1985), Arslanov (1985), and Kovaliukh and Skripkin (1994), using a Tri-Carb® 3170TR/SL in the Radioisotope Research Laboratory at the Nature Research Centre in Vilnius, Lithuania. AMS dating was performed at Poznan Radiocarbon Laboratory, Poland. The ^{14}C calibration program OxCal v. 3.1 (Bronk Ramsey 2001) and the calibration curve IntCal09 (Reimer *et al.* 2009) were used for the calibration of ^{14}C dates. All dates used were calibrated to calendar years BC/AD.

Pottery samples were dated in the Thermoluminescence Laboratory of the Department of Geoecology and Palaeogeography, Maria Curie-Skłodowska University in Lublin. The thermoluminescence age (TL age) is determined as a quotient of archaeological dose (AD) and dose rate (DR). The archaeological dose is the sum of the equivalent dose (ED) due to natural radioactivity and correction (I) due to the fact of non-linear increase of thermoluminescence for small absorbed doses (Mejdahl, Wintle 1984). The DR and AD values and TL age were estimated as described in Bluszcz (1989), and Kusiak *et al.* (2011). In order to determine AD value, a pottery sample of about ten grams in weight was taken, and its one to two-millimetre-thick external layer was removed. Then a sample was carefully crushed, and the

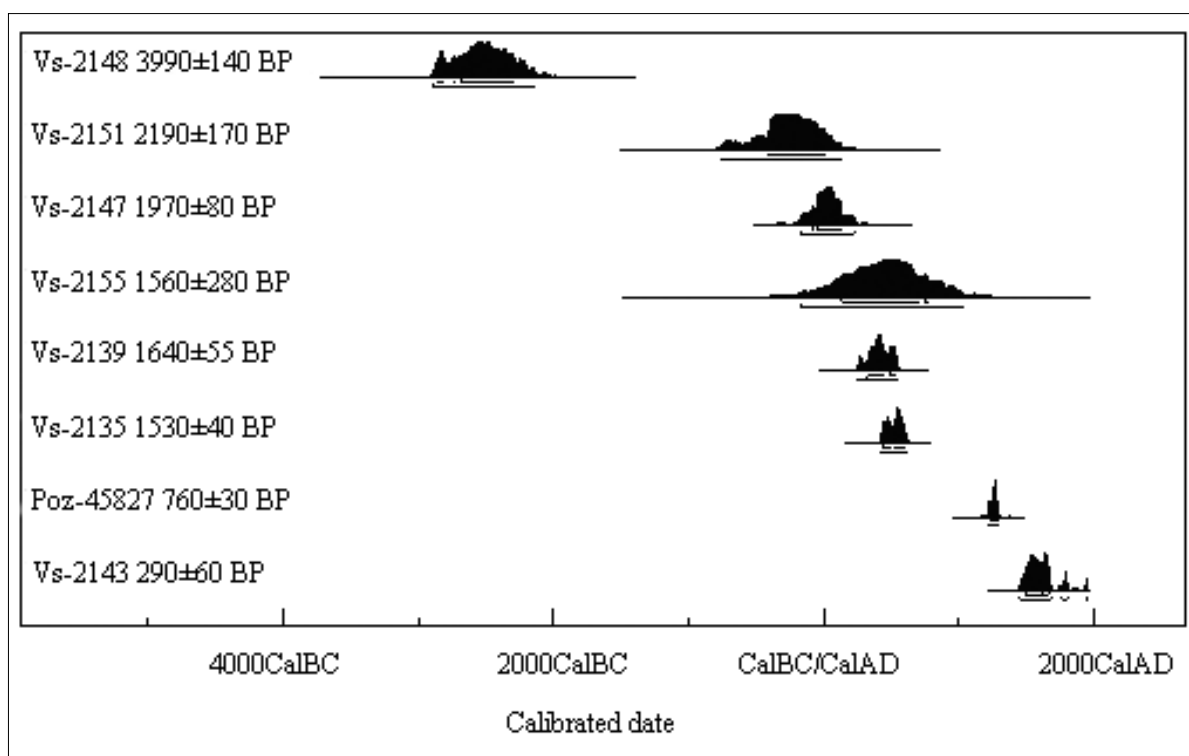


Fig. 10. Probability multiplots of ^{14}C dates from the Skomantai site (after J. Mažeika).

30 to 40 μm polymineral fraction was separated using the sieve method. The mineral material obtained was cleaned by etching with HCl and H_2O_2 . A separation of minerals was not made. The TL light sum was read under narrow region 235 to 245°C_[MI] of the TL glow curve using the TL reader/analyser RA'94 type (with the EMI 9789 QA photomultiplier). The confidence interval of obtained values of TL age is 68%.

Geochemical investigations

The samples representing the BIS-3 core were analysed at the Institute of Physical Geography, the Faculty of Geography and Regional Studies of the University of Warsaw, Poland. Samples used for geochemical analyses were dried at 105°C, and then sieved (\varnothing 1.0 millimetres). The extraction was done with concentrated suprapur nitric acid. The total amount of chosen elements, that is, Fe, Mn, P, Cd, Cr, Pb and Zn, were determined by ICP MS method (Perkin Elmer Sciex Elan 6100 DRC). The organic matter content was determined using the loss-on-ignition method (550°C, one hour).

The samples representing the area of the hill-fort and west settlement were analysed in the Laboratory of Geochemistry, the Nature Research Centre in Vilnius, Lithuania. The material was air-dried, homogenised,

sieved (\varnothing 2.0 millimetres) and milled by MM 400 mill. The measurement of Al, Ba, Br, Ca, Cr, Cu, Fe, Ga, Hf, K, Mg, Mn, Na, Ni, P, Pb, Rb, S, Si, Sr, Th, Ti, Zn, Zr was done by energy dispersive X-ray fluorescence, using Turboquant for the pressed pellets method with the calibration procedure elaborated by the manufacturers of SPECTRO XEPOS equipment.

The total carbon (TC) and carbonate-free residue (TOC) measurements were made from the samples collected within the hill-fort, the west settlement and test pits Nos 1 and 2 (Fig. 2D). The total carbon (TC) and carbonate-free residue (TOC) were determined by the high-temperature oxidation method using the elemental analyser liquiTOC (Elementar analysensysteme GmbH, Hanau-Germany). The procedure involved heating the sample at 950°C, and measuring the combustion products by infrared energy detector (Leong, Tanner 1999). The difference between the two carbon measurements (TC–TOC) gives the total inorganic carbon (TIC) content.

To distinguish and group the interrelated chemical elements according to their origin (paragenetic groups), a cluster analysis was applied. The information obtained could be useful for the detection of possible palaeoanthropogeochemical indicators (PAI); and for plotting the dendrogram, Ward's method with the Euclidean distance was chosen. Two groups of interrelated ele-

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ments were distinguished. The chemical elements (Br, Ca, Cu, Mn, P, Pb and S together with TOC and TIC) included in one of them can be classified as PAI.

The colour of the sediments, as well as the subdivision of the territory into the hill-fort and settlement area, served as a basis for grouping the samples. For PAI analysis, the median concentrations of particular chemical elements, as well as of TOC and TIC, were calculated for grey horizons of sandy sediments, mostly found in layers of zero to 90 centimetres. The median values of elements were compared with those representing pure sand collected at a distance from the investigation area. This layer was used as the local background for the detection of anthropogenic anomalies. The enrichment factor (EF) was calculated to reduce the impact of the lithogenic soil constituent on the intensity of PAI. The necessity of the enrichment factor (EF) is proven by the differences in median values in pure sand (PS) and the underlying till (T) layer. The EF is widely employed for the detection of the contribution of anthropogenic emissions to chemical element fluxes in the sediments (Reiman *et al.* 2003; Bourenane *et al.* 2010). For the reduction of the chemical elements' variability caused by grain size and the mineralogical composition of the sediments, chemical elements (ChE) are normalised to conservative crustal (generally Al, Li, Ti or Zr) elements (ChER). The following formula is used for this purpose: $EF = (ChE/ChER)$ in the sample/ $(ChE/ChER)$ in the crust. For the improvement of the EF sensitivity to the anthropogenic impact, a formula is used where 'crust' is replaced by local background, for example, analytical results from a lower horizon sample (Hernandez *et al.* 2003; Bourenane *et al.* 2010).

To reveal the geochemical indicators of the Skomantai archaeological sites, and their differences in sediment columns, the enrichment factors were calculated as follows: $EF = (ChE/(Al*Ti))^{1/2}$ in the selected layer/ $(ChE/(Al*Ti))^{1/2}$ in the pure sand layer. Aluminium was chosen for normalisation, since it is one of the main components of clay; meanwhile, Ti is more resistant to environmental weathering processes.

Pollen survey

Standard procedures (Berglund, Ralska-Jasiewiczowa 1986, pp.455-484) were used to extract pollen and spores, and a known number of *Lycopodium* spores (Stockmarr 1971, pp.615-621) was added to determine the pollen concentration. Fægri and Iversen (1989), Moore *et al.* (1991), Moe (1974) and reference collections were used for the identification of pollen grains

discovered. The percentage pollen diagram is based on the sum (ΣP) of arboreal (ΣAP) and non-arboreal (ΣNAP) taxa. The construction of a diagram reflecting human impact followed the plant groups suggested by Behre (1981, pp.225-245), Berglund and Ralska-Jasiewiczowa (1986, pp.455-484), Gaillard and Berglund (1988, pp.409-428) and Veski (1998, pp.1-119). The pollen diagram was prepared using a 'Tilia' (version 2) and 'Tilia graph' (version 2.0 b.5) spreadsheet and graphic computer programs (Grimm 1992, p.56).

Results

The chronological framework

The chronological attribution of the Skomantai archaeological site was based on typological analyses of the potsherds discovered, radiocarbon (^{14}C) data (eight investigated samples), and the results of thermoluminescence (TL) analysis (five TL dates) (Tables 1-3; Fig. 10).

The formation of a cultural layer dating from about 50 BC to 130 AD (Vs-2147) in the area of the southeast settlement suggests that human activity started in the area during the late phase of the Early Iron Age, or at the end of the Late La Tène Period (Grigaravičienė 1995, p.5ff.), or about the middle of the first century BC. The southeast settlement was used actively during the first millennium AD, as potsherds with a rough and smooth surface are quite common here. However, the possibility of the earlier occupation of the hill-fort cannot be excluded, as an increasing intensity of erosion processes in the eastern part of the slope dates from 410 BC to 10 AD (Vs-2151). The further analysis of the chronological attribution indicates ongoing human interference until the fourth or fifth century AD, which is also confirmed by erosion activity (130-710 AD, Vs-2155) and the chronology of the discovered potsherds. Potsherds with a smooth surface representing the lower part of the cultural strata of the hill-fort and west settlement were dated to 363±119 AD (Lub-4932), suggesting that the settlement and hill-fort were used until the end of the Roman Iron Age, which was a typical process in Lithuania (Tautavičius 1996, p.12ff). Afterwards, the human activity had a particular hiatus in the hill-fort. In the west settlement, human activity was recorded during the Migration Period as well. This conclusion is supported by TL dating: 507±105 AD (Lub-4936) and 675±96 AD (Lub-4935) (Table 3).

The data collected indicates a chronological hiatus that could be synchronised with the final quarter of the first millennium AD. On the basis of TL data, the potsherds representing the upper part of the cultural layer in the

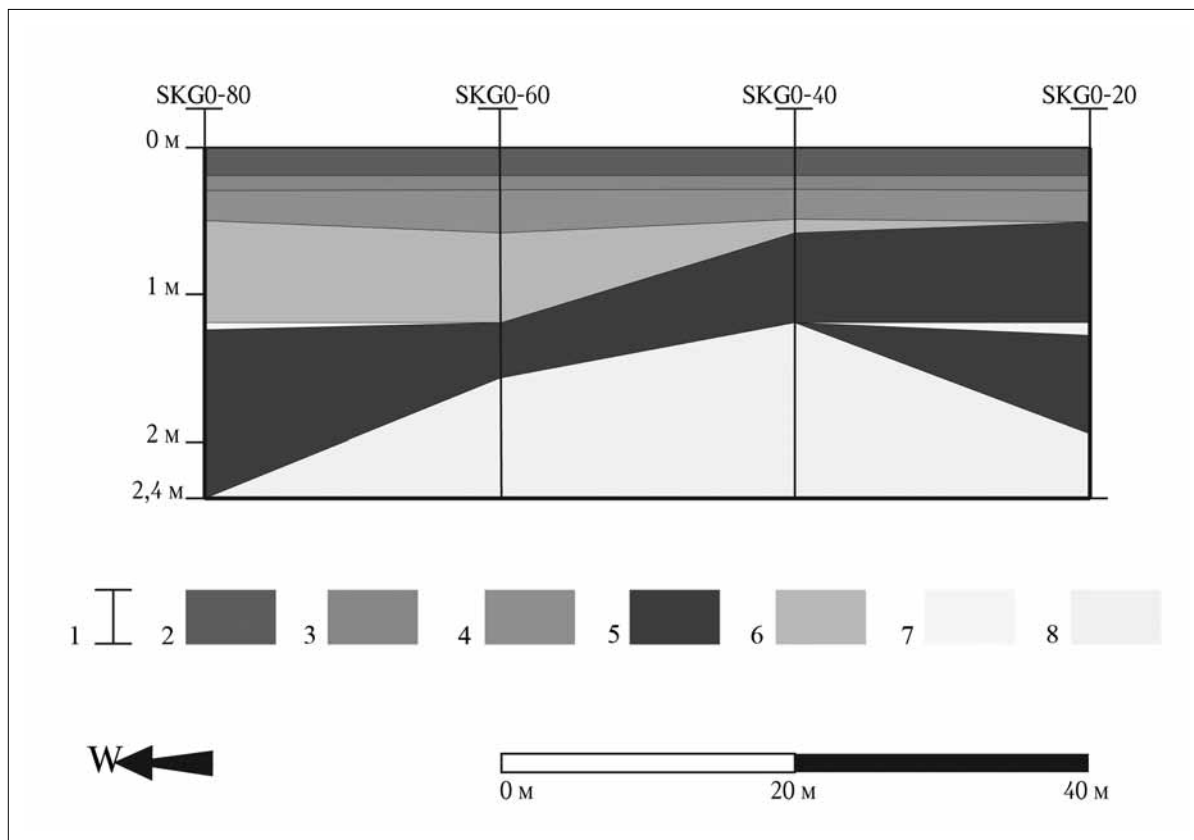


Fig. 11. The structure of the cultural layer in the west settlement, based on coring data (investigations of 2010) (after A. Bliujienė and R. Taraškevičius).

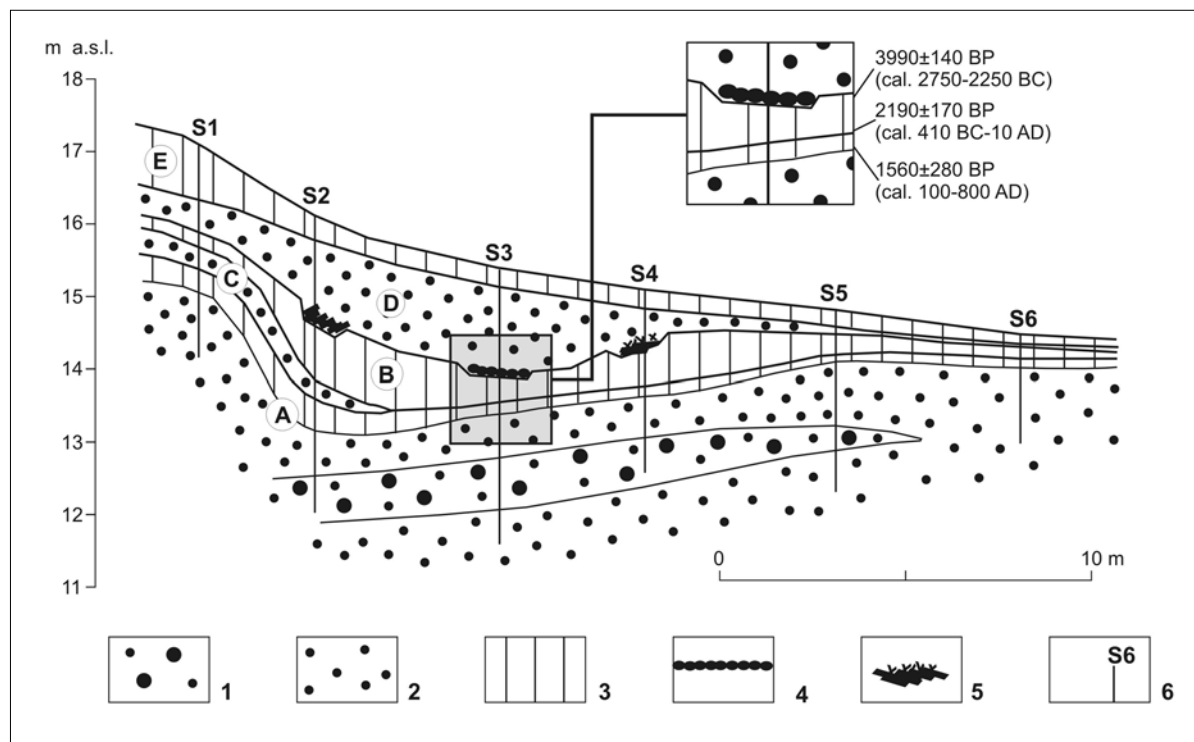


Fig. 12. A lithological cross-section of the southeast slope: 1 medium and fine-grain sand; 2 fine-grain sand; 3 organic and mineral matter; 4 stones and boulders; 5 a layer of charcoal; 6 boreholes (A – primary relief before human settlement; B – a phase of slope erosion after the first phase of human activity; C – the main phase of human activity; D – a phase of slope erosion, E – the present landscape) (after P. Szwarzewski, ¹⁴C dates J. Mažeika).

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hill-fort and the west settlement were dated to 836 ± 86 (Lub-4933) and 926 ± 81 (Lub-4934), which coincides with the Viking Age in Lithuania (Kazakevičius 2007, p.301ff). The chronology of the charcoal representing the cultural deposits of Zakainiai and Vyskupiškiai hill-forts (cal ^{14}C data: 780 ± 70 AD, 820 ± 90 AD, 900 ± 100 AD, (Fedajevs 2006a, p.32f; 2006b, p.34ff), situated at a distance of two kilometres and 16 kilometres from the investigated site, correlate well with the second occupation stage in Skomantai, suggesting regional population activity. *Inter alia* pottery with a rough and smooth surface is common in both mentioned sites (Fedajevs 2006a, p.32f; 2006b, p.34ff; Bliujienė 2011a, p.38ff). The stage of human activity discussed may have been related to the reconstruction of the hill-fort and the subsequent activation, or the erosion processes that resulted in the deposition of the strata date to 2680-2290 BC (Vs-2148). The older dating of the sediments investigated can be explained as indicating

the age of the material, and not relating to the chronology of the layer itself.

Finally, the structure of the ramparts and ditches (Baubonis, Zabiela 2005, p.428; 2009, p.60), as well as written sources (Scriptores 1863, p.664ff), suggest the existence of the Skomantai stronghold between the middle of the 13th century and the middle of the 14th century AD. High rates of cultivars, ruderal species and representatives of open habitats recorded in pollen spectra dating from the middle of the 13th century AD (1240-1280 AD, Poz-45827) mark extensive human interference. Furthermore, ongoing population activity was recorded during the later stages of the second millennium AD in the area, as the upper part of the cultural strata in the southeast settlement was dated to 1490-1600 AD (Vs-2143).

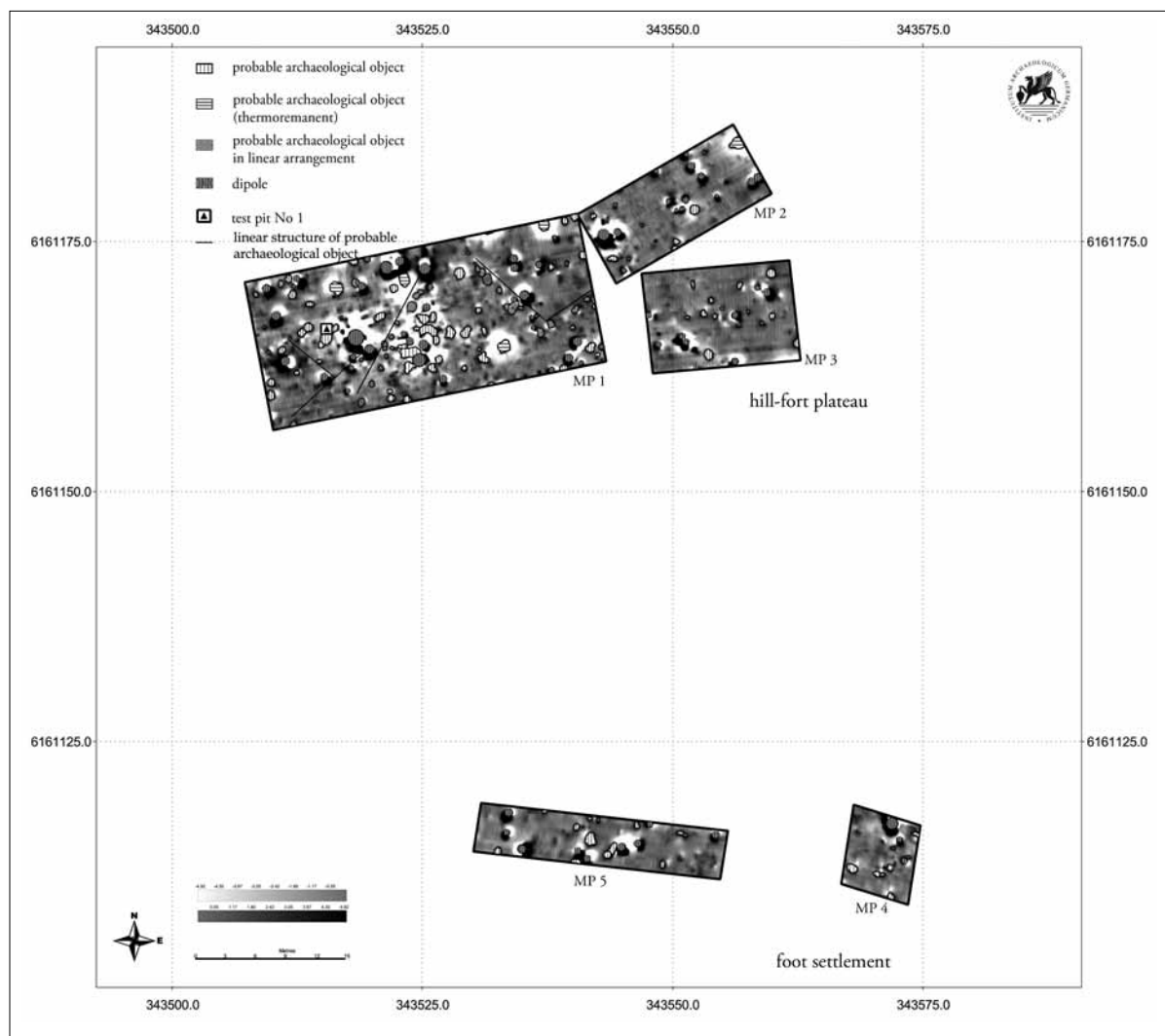


Fig. 13. The results and preliminary interpretation of the geomagnetic survey (-5/+5 nT) (by S. Messal).

The lithological composition and sedimentation pattern

The distribution of the cultural layer consisting of minerogenic matter, mainly silty sand with organic matter and charcoal, was established by summarising the data obtained from the cores and trenches representing the hill-fort and settlements. Within the hill-fort, the cultural layer is dominated by sand with organic components, but it was low in charcoal. The data collected clearly suggests the existence of two cultural layers in the west, south and east parts of the hill-fort. The depth of these sediments increases up to 20 to 65 centimetres, but the lower cultural bed reaches 15 to 20 centimetres only. In the rest of the hill-fort, only the upper cultural layer, reaching up to 30 centimetres, was fixed. In the southeast settlement, the depth of the extensive but mixed cultural strata is about 30 centimetres (Plate VII.2a). In the west settlement, the depth of the cultural deposits consisting of two layers varies at around 35 to 80 centimetres (Fig. 11). The underlying sediments consisting of sand and sandy loam are enriched by clayey particles, soil and charcoal. Till stretches below the bed described.

The detailed lithological-sedimentological survey of the sediments (Fig. 12) deposited on the southeast slope of the hill-fort suggests a few stages in the sedimentation history. The lowest part of the section, consisting of the *in-situ* laying beds, is dominated by medium and coarse-grain sand. The organic horizon has developed on top of these deposits. It is quite likely that this surface was used locally for agriculture. Land use changes and human activity at the hill-fort resulted in the acceleration of erosion processes, and the base of the stronghold started to be covered by eroded material coming from the slopes. The accumulation of this material was concentrated in quite a narrow belt, at a distance of 35 to 40 metres these sediments were absent.

Changes in the lithology, including the appearance of stones and pebbles identified in the drillings next to the slope of the hill-fort, suggest that the indicated erosion/accumulation cycles were separated by calm periods. Altogether, four periods relating to the formation of the soil cover or the accumulation of organic and mineral deposits were indicated (Fig. 12). Proportionately these are separated by three intervals where deposition could be related to erosion and/or the delivery of mineral matter from the slope. The man-made acceleration of erosion on the slopes and the anthropogenic origin of the sediment are confirmed by the presence of pieces of charcoal and the lack of sedimentological structures (massive deposits, a lack of layers) in the layer. The sediments recorded suggest the existence of a river channel flowing next to the stronghold during the formation of the lower part of the section (a depth interval of 3.2 to 2.4 metres) and the filling up of the channel later (2.4 to 1.35 metres). According to ¹⁴C data, a correlation between the formation of the sediments recognised in the BIS-3 core and the development of the settlement can be established.

The population history of the site

The new data collected suggests the presence of two cultural layers both on the plateau of Skomantai hill-fort and in the areas of both the foot settlements. Test pit No 1, excavated on the plateau of Skomantai hill-fort (Fig. 2D), has provided scientists with a set of handmade pottery with a smooth surface alongside potsherds that belong to vessels with a rough surface (Table 1.1-3). In the area of the west settlement, handmade pottery with a smooth surface and a stone trowel were collected from the surface (Table 1.4-5). Test pit No 2 revealed an extensive but mixed cultural layer 30 centimetres thick (Figs. 2D; Plate VII.2a). Handmade pottery with a grainy and rough surface was found

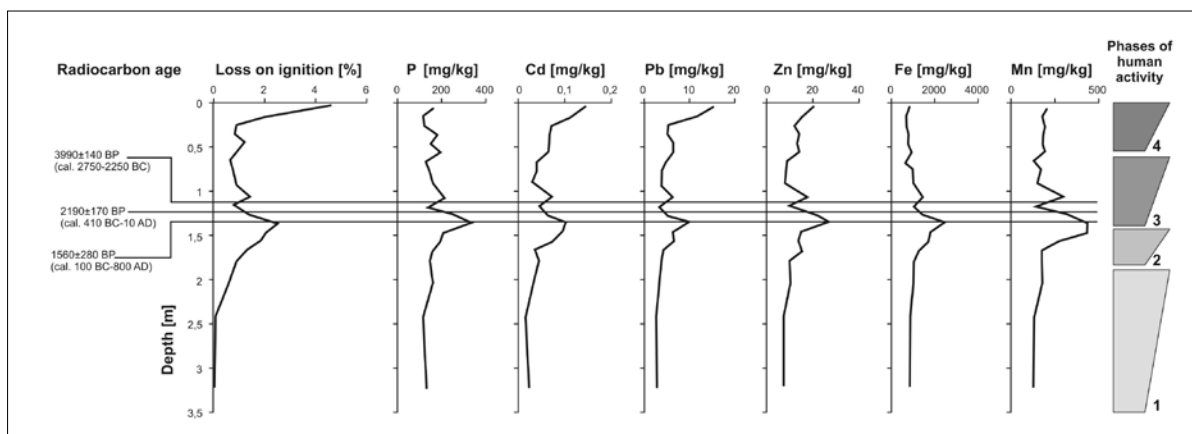


Fig. 14. The distribution pattern of particular chemical elements in BIS-3 core and phases of human activity: 1 the La Tène Period (or Early Iron Age); 2 the Roman Iron Age; 3 the Medieval period; 4 modern times (after P. Szwarczewski).

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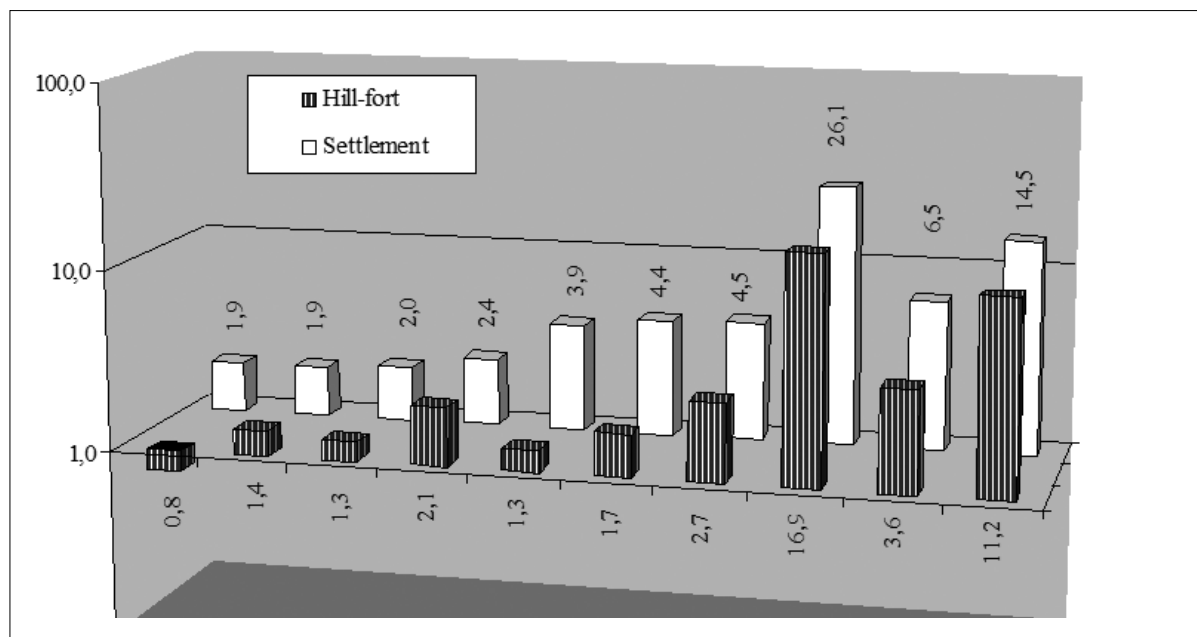


Fig. 15. Median values of enrichment factors of chemical elements, proposed as PAI for archaeological investigations. The local background values used for EF calculation are (in ppm): Ca – 1850; Pb – 8.27; P – 758; Br – 1.25; Zn – 18.7; Cu – 3.12; Mn – 138; S – 6.70; TIC – 289; TOC – 862 (after R. Taraškevičius).

along with handmade pottery with a smooth surface, as well as potsherds dating from the 15th to the 17th centuries AD (Table 1.6; Plate VII.2a-c).

According to the archaeological evidence, handmade pottery with a grain surface found in the Skomantai site dates from the Late Bronze Age to the Early Iron Age, whereas pottery with a rough surface is ascribed to the rather long chronological period from the Roman Iron Age to the transition from the Late Migration Period to the Viking Age (Grigaravičienė 1995, p.224ff; Vasks 1996, p.152; Vengalis 2009, pp.56-64, Figs. 3-4, 11). Pottery with a smooth surface falls into a wide-range chronological span, and very little is known about its typology or chronology (Michelbertas 1986, p.85ff; Tautavičius 1996, p.266ff). According to data from archaeological material from western Lithuania, pottery found in the west settlement can be dated to the ninth or the tenth centuries AD (Žulkus 2010, pp.255-277).

For a reconstruction of the occupation history in the Skomantai archaeological site, a geomagnetic survey was applied (Fig. 2D). Unfortunately, most of the area of the hill-fort plateau is currently used as a resting place for people; therefore, modern hollows, fireplaces and numerous metal objects were identified just under the topsoil. Therefore, the subdivision between modern and archaeological objects is complicated. This is particularly true for thermoremanent features (fireplaces, hearths), which are not dateable without further investigations. However, alongside the anomalies caused by recent activity, anomalies with probable archaeological significance were detected. These may presumably be

interpreted as pits, post-holes or stones, or stone heaps. Unfortunately, clear patterns as evidence for settlement structures cannot be identified. This is partly attributable to the small measuring plots, which enable only limited insights into the settlement pattern. Only in the central part of MP 1 could some linear arranged archaeological features be detected, which may indicate the location of a former building or fence structures (Fig. 13).

Two measurement plots (MP 4 and 5) were also surveyed along the southern foot of the hill-fort plateau to verify the existence of an outer settlement (Fig. 2D). MP 5 was therefore located on the path leading down to the foot of the hill, so that in this part modern disturbances could be expected. The survey nevertheless revealed some anomalies of probable archaeological significance distributed evenly in both measurement plots. Presumably, these mostly positive anomalies may be interpreted as pits, post-holes or stones, or stone heaps, and may indicate settlement activities of unknown date.

The geochemical pattern

The vertical variability of geochemical record can be used to assess the human activity phases or the rate of denudation processes. The content of trace elements in the sediments accumulated at the base of the slopes or in the local depressions depends on both geomorphic processes and human impact. Different forms of human activity, such as agriculture, animal husbandry

and metallurgy, influence the geochemical properties of the sediments. In most cases, an increasing concentration of particular elements (such as Cd, Pb and Zn) can be correlated with stages of human impact and with the changing environmental situation, such as the moisture regime (Fe, Mn), including a rise in the water table. This is why these proxies can be used to determine the main phases of human economic activity. The changes in selected elements in core BIS-3 are presented in Fig. 14.

The deforestation of the slopes and the economic activity of the local population favoured the delivery of material to the bottom of the valley. This is illustrated in further declines in loss-on-ignition values recorded at 1.3 to 1.2 metres, 1.1 to 0.6 metres, and 0.45 to 0.3 metres depth. Changes in agricultural and economic activities could be correlated with the variability of the phosphorus (P) content recorded in the sediment. Samples with a higher content of this element represent a period of extensive use of the hill-fort and the surroundings. Anthropogenic additions of phosphorus to the soil come from human refuse and waste, the products of animal husbandry in barns or pens and on

livestock paths, or intentional enrichment from soil fertiliser (Holliday, Gartner 2007, pp.301-330). The most interesting information about humans comes from the analysis of trace elements such as Cd, Pb and Zn. An increased content of these elements in the vertical profile could be associated with economic activity during the Roman Iron Age (2.5 to 1.6 metres) and the operation of the settlement throughout Medieval times: there are two peaks, corresponding to the two phases of occupation of the site (1.5 to 0.8 metres), and the effects of economic development in the modern era (from the surface to a depth of 0.3 metres). The elevated iron and manganese content (1.7 to 0.9 metres deep) could be related to the formation of wet conditions at the base of the hill-fort (bog ore). According to the geochemical, lithological and sedimentological data collected (Figs. 12; 14), conclusions could be made about the existence of a natural moat during Late Roman and Early Medieval times in the investigated area.

Two main branches (Th, Hf, Sr, Ba, Rb, Ni, Fe, Y, Cr, Nb, Ti, K, Al, Mg, Si, Zr, Na, and Pb, Ca, Mn, Zn, Cu, P, Br, TIC, S, TOC) were distinguished in the dendrogram representing the samples collected within the

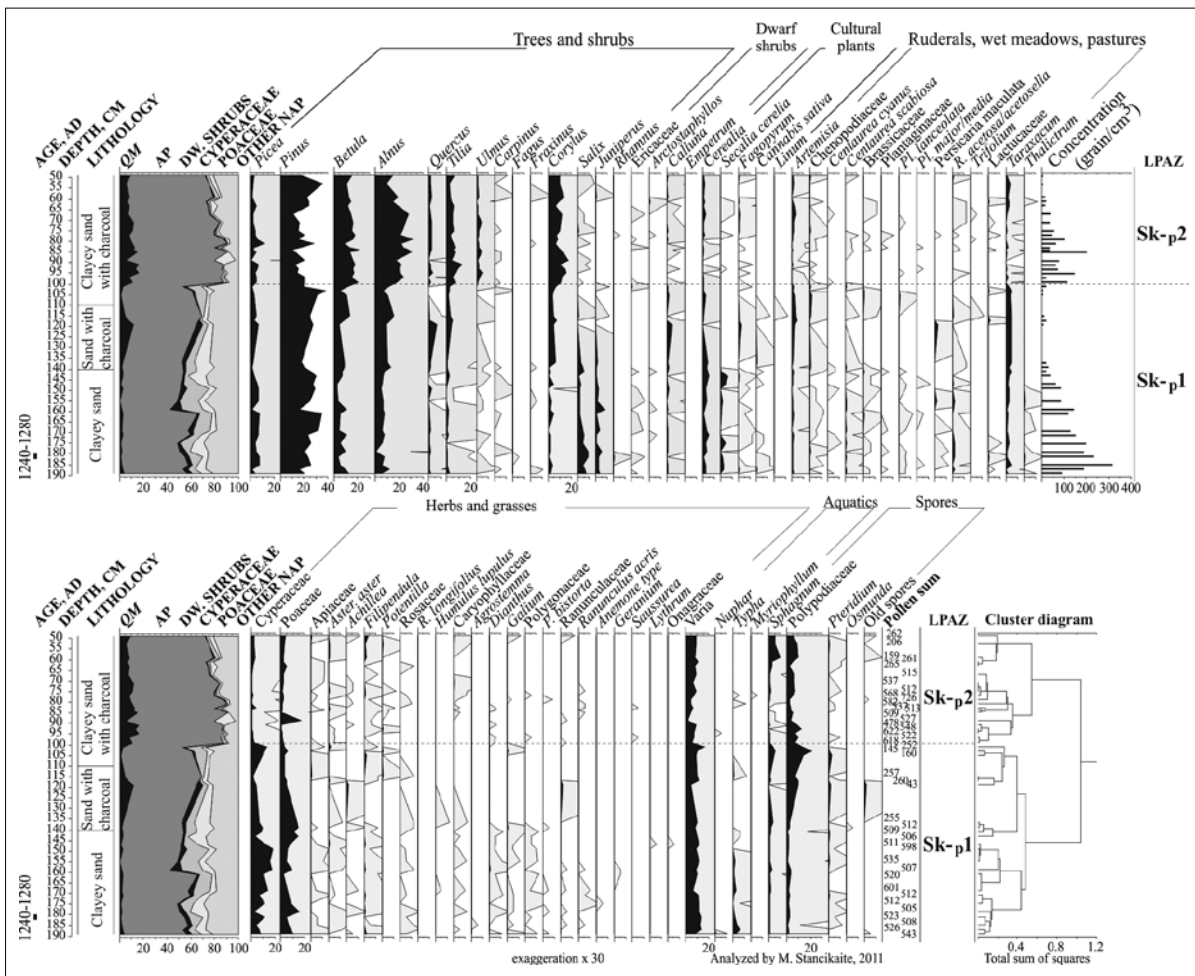


Fig. 16. A percentage pollen diagram of selected taxa (after M. Stančikaitė).

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area of the hill-fort and the western foot settlement. In the left branch, lithogenic elements (Th, Hf, Sr, Ba, Rb, Ni, Fe and Y, Cr Nb, Ti, K, Al, Mg) representing the clayey part of sand (Salminen *et al.* 2006; Zinkutė *et al.* 2011) are concentrated; whereas the second group consists of clastogenic elements, Si, Zr and Na, typical of mainly sandy sediment. Biophilic elements, or elements showing a large affinity of organic matter (Kabata-Pendias, Pendias 2001), are concentrated in the right branch of the dendrogram. Here the cationophilic (Pb, Ca, Zn, Mn, Cu and P) and anionophilic elements (Br and S), together with TOC and TIC, form two respective groups.

All the elements in the right branch of the dendrogram, and selected representative elements from each compact cluster in the left branch, were selected for detailed analysis by means of EF. This was done because the content of the chemical elements in the layers of the cultural origin may increase due to sorption by clay particles (Daskalakis, O'Connor 1995). To reduce this impact on the Pagi elevation, EF was used.

According to the data collected, the higher representation of Si could be associated with Quaternary sediments enriched by sand discovered in the hill-fort. Meanwhile, in all the layers investigated within the west settlement area, values of TOC are higher and TIC is better represented in TGS and BGS beds in comparison with the hill-fort plateau (Fig. 15). The BGS layer, especially within the settlement, is enriched by organic matter.

The values of enrichment factor (EF) of all chemical elements except Sr, K and Al are higher than 1 in the investigated layer of supposedly cultural origin. If there is no input from human or any other external source, the EF ratio is approximately usually 1 (Sucharova *et al.* 2012, pp.138-145).

The vegetation pattern and stages of human activity

Two local pollen assemblage zones (LPAZ), suggesting two stages in the vegetation history and human intervention, have been defined with the aid of CONISS, a stratigraphically constrained cluster analysis (Grimm 1992, p.56) in the Skomantai pollen diagram (Fig. 16).

SkP-1 (187–98 centimetres). This LPAZ is marked by a high frequency of plants related to human intervention, including those typical of agricultural fields and open pasture. A continuously high proportion of *Cerealia undiff.* (up to 5.3%) points to extensive agriculture, including the cultivation of *Secale cerealia*,

Linum, *Fagopyrum* and *Cannabis sativa*. The existence of pastures and grasslands is confirmed by the presence of *R. acetosa/acetosella*, *Plantago lanceolata* and others. A high frequency of ruderals, *Artemisia*, *Chenopodiaceae*, signals the presence of an extensive settlement nearby. Simultaneously, pollen spectra suggest that *Pinus* predominated in the local forest structure, whereas the number of *Betula*, *Alnus* and broad-leaved species was negligible, indicating an open vegetation structure.

SkP-2 (98–48 centimetres). A drop recorded in NAP (herbs and grasses) curves was coincident with an increase in the AP (*Alnus*, *Betula* and *Corylus*) number, suggesting a remarkable change in the local vegetation structure, or a re-occupation of open habitats by forest vegetation. Obviously, the forest gained more ground, and the area covered by light-demanding species, *Juniperus*, declined. Nevertheless, the relatively high proportion of apophytes and anthropochores (plants introduced by humans) implies the continuous existence of agricultural fields and pastures.

Discussion

Skomantai hill-fort, with two settlements, together with six neighbouring hill-forts and burial grounds, as well as a holy site discovered, comprises a small micro-region covering a 2,000-year history (Bliujienė 2011a, p.38ff) (Plate VII.1). Taking into account the theoretical model of the 'central place' (Lang 2002, pp.18-25; Näsman 2011, pp.185-192, Fig. 1), the Skomantai site may be described as the central one in the micro-region, or 'power centre' as it is accepted in the east Baltic (Lang 2002, p.20ff). According to archaeological data collected in the Skomantai site and the neighbouring Mikužiai burial ground, dating from the Early Roman Iron Age, the importance of Skomantai started to increase during the Early Roman Iron Age. However, for a further description of Skomantai's history, detailed chronological, archaeological and environmental data was required. To fill this gap, multi-proxy investigations were performed, revealing the main stages in the history of the population, environmental changes and human-nature interaction during the last 2,000 years in the Skomantai archaeological complex.

The data collected suggests that the initial stage of human occupation in the southeast settlement of the Skomantai archaeological site could be dated to the late phase of the Late Early Iron Age or the end of the Late La Tène Period (Grigaravičienė 1995, p.5), that is, the middle of the first century BC. Actually, the hill-fort may have been occupied even earlier, as in-

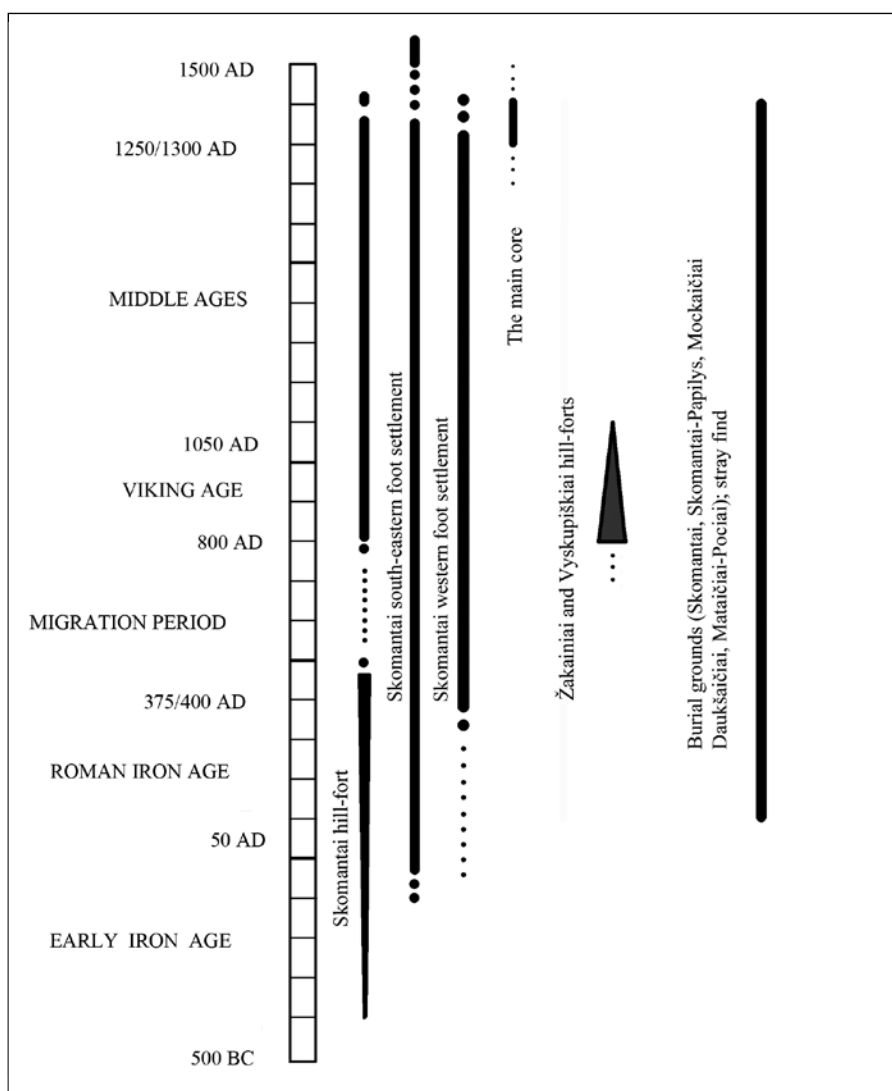


Fig. 17. A summary chart of the population and environmental history in the Skomantai archaeological site and its surroundings (chronological scale according to A. Bliujienė 2011b, p.xxxvii, Table A2).

creasing erosion activity started during the second half of the first millennium BC. An increasing amount of organogenic components reveals the destruction of the hill-fort's plateau in about 410 BC to 10 AD. A further archaeological record, potsherds with a grain surface typical of the Early Iron Age and the last centuries of the first millennium AD (Grigaravičienė 1995, p.224ff, Fig. 136.3, 6; Vasks 1996, pp.147-150) (Table 1), suggests the early occupation of the hill-fort. The recorded interval was coincident with the period of social and economic changes recorded all around Lithuania (Grigaravičienė 1995, pp.98-226; Brazaitis 2007, pp.287-315) and neighbouring areas (Vasks 2007, pp.32ff; Sperling, Luik 2010, pp.140-150), as well as across Europe (Kristiansen 2000, pp.359-420; Harding 2011, pp.327-400; Wells 2011, pp.405-446).

New data indicates ongoing cultural activity during the Roman Iron Age (Michelbertas 1986, pp.199-222), as well as the exploitation of the hill-fort until the onset of the Migration Period, around the fifth century AD (Tautavičius 1996, p.12ff) in Skomantai. TL and ¹⁴C data points to the conclusion that Skomantai hill-fort and the southeast settlement were used simultaneously, between the second half of the first century BC and the end of the fourth century AD (Fig. 17). The presence of linear-arranged archaeological features may indicate the location of a former building or fence structures on the hill-fort plateau, although the precise chronological attribution of these objects is unknown. The thickness and distribution of the cultural layer suggests extensive human activity in the settlements during the Migration Period. Furthermore, the concentration of human activity within the settlement is also

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shown by the geochemical record, since ancient human practices, woodworking, cooking, meal preparation and consumption, pottery making and others, were related to the distribution of numerous identifiable elements (Middleton, Price 1996, pp.673-686; Parnell, Terry 2002, pp.379-402; Luzzadder-Beach *et al.* 2011, pp.119-128). The high intensity of palaeolife within the western settlement area was proven by higher total PGI values (composed of summary Zlito and Zorg indices), 1.5 times in comparison with samples representing the cultural layer of the hill-fort.

During the Early Iron Age, representatives of the Barrow culture of the west Balts (Grigaravičienė 1995, p.90ff; Brazaitis, 2007, pp.309-317) settled in the area, as numerous potsherds of grain surface pottery were collected there. During the Roman Iron Age and Migration Period, descendants of Barrow culture (Michelbertas 1986, p.29ff), that is, groups of West Lithuanian Stone Circle Grave culture (Grigaravičienė 1995, p.90ff; Michelbertas 1986, pp.28-41), inhabited the region, using pottery with a rough surface and ceramics with a smooth surface (Michelbertas 1986, p.185ff). The pottery with a rough surface was used extensively between the third and the eighth centuries AD (Michelbertas 1986, p.185ff; Tautavičius 1996, pp.264ff; Vengalis 2009, pp.56-64, Figs. 3-4; 11), and is the most common type of ceramics known in Lithuania. This type of ceramics was recorded in neighbouring areas, in Latvia, the Kaliningrad region, west Belarus and northeast Poland (Tautavičius 1996, p.267ff; Vengalis 2009, p.56).

Approaching the initial stages of the Migration Period, a remarkable decline in human activity in the Skomantai hill-fort started. A written source reveals that a climatic catastrophe took place in the northern hemisphere in 536 AD, which resulted in the darkening of sunlight and a significant cooling of the air temperature (Axboe 2001, pp.126-132). This disaster led to a serious famine and serious mass fatalities in Central Europe, known as a time of very drastic cultural events (Axboe 2001, pp.126-132; Tvauri 2012, p.36). The latest stages in the Roman Iron Age and the initial stages of the Migration Period, the end of the fourth century to the fifth century, were characterised as an interval of decay, followed by the abandonment of the landscape in the east Baltic (Michelbertas 1986, p.194, Fig. 85, Veski 1998, pp.1-119). The climatic deterioration recorded all around vast areas of the European continent is presumed to be one of the main causes of the above-mentioned changes (Dreßler *et al.* 2006, pp.25-37). However, recent investigations have demonstrated rather high ongoing population activity, including

agricultural practices, in particular areas of Lithuania (Bliujienė 2003, pp.122-134, Fig. 1; Simniškytė 2005, pp.28-40; Simniškytė *et al.* 2003, pp.268-284, Fig. 1). Archaeological data representing this time interval attests to the changing occupation system of the sites, when hills, that is, hill-forts, were abandoned and settlements were enlarged. A similar situation was recorded in Skomantai, where the hill-fort plateau was abandoned, whereas both settlements at the foot were still in use. Moreover, the presence and chronological attribution of ceramic shards suggests ongoing population activity. Being one of the most important sites in the region, and probably housing a strong community, Skomantai may have developed as a typical site for that time, when the population was concentrated in the foot settlement, and the former hill-fort/settlement system was changed to a foot settlement/hill-fort one (Simniškytė 2005, pp.28-40; Simniškytė *et al.* 2003, p.283).

Archaeological and TL data suggests that the resettlement of the Skomantai hill-fort, and of the whole region (Fedajevus 2006a, 34f; 2006b, 34ff), started during the final quarter of the first millennium AD, which generally coincides with the Viking Age in this part of Lithuania (Žulkus 2004, pp.80-103). The Viking Age is described as a time of economic prosperity and increasing trade, when strong fortified castles were built in hill-forts for the local nobles (Zabiela 1995, pp.81-115; Žulkus 2004, pp.80-103; Simniškytė 2005, pp.28-40). Simultaneously, a concentration of political power and the evolution of local society took place. Similar processes were recorded all around Lithuania (Genys 1987, pp.141-152; Bliujienė 2003, Fig. 1; Žulkus 2004, pp.42-65). Regrettably, when talking about Skomantai, the scarcity of archaeological data from the Viking Age should be noted. All conclusions concerning the history of the population, and the material and spiritual culture of the local people, should be based on data representing the graveyards investigated in the vicinity. A few especially rich graves representing different burial grounds were excavated in the close vicinity of the Skomantai hill-fort burial grounds: Skomantai (tenth to 13th century AD), Mikužiai (second to 12th century AD) and Papilys (second to third century AD) (Nagevičius 1935, p.70ff; Bliujienė 1989; Michelbertas, 2005, pp.94-109) (Figs. 6.1-3; 7). Several extraordinary artefacts (second to late 13th century AD) were collected from the Mockaičiai burial ground (Nagevičius 1935, p.68f) (Figs. 6.4-6; 8). From a cultural point of view, the local communities were allied to the people, who, according to Late Medieval written sources, could possibly be ascribed to the Balts, that is, the people of the Lamata area (Tautavičius 1996, p.77ff,

Fig. 1) or to the Scalvians (Volkaitė-Kulikauskienė 1987, p.190ff, Fig. 186). Numerous bronze ornaments were discovered in the Mikužiai burial ground, whereas in Skomantai a cremated human body was buried with a horse skeleton (Nagevičius 1935, p.70ff) (Fig. 7). This type of grave was traditional in the Lamata area during the Viking Age and the Middle Ages (Fig. 7).

Historical records indicate indirectly the existence of Skomantai stronghold during the second half of the 13th century AD (Scriptores 1863, p.664ff).²⁰ The archaeological data supports the mentioned historical evidence, as the structure of the ramparts and ditches is typical of that chronological interval (Baubonis, Zabiela 2005, p.428; 2009, p.59ff) (Fig. 2). Situated on the southwest outskirts of Samogitia (Žemaitija), the Skomantai stronghold may have played an important role as a military centre during the Teutonic onslaughts. Between the 13th and 15th centuries AD, the Livonian and Teutonic orders directed a series of military campaigns against the Grand Duchy of Lithuania, aiming to spread Christianity in the region (Žulkus 2004, p.185ff).

Although the political instability mentioned may have negatively influenced the local population, palaeoenvironmental data, that is, the pollen record (Fig. 16), provides evidence of extensive human intervention in the surroundings of Skomantai during the first half of the Middle Ages. According to pollen data, the landscape was open and dominated by treeless vegetation. This could partly be associated with the flourishing of wet meadows in the valley of the River Veiviržas. Deforestation was also reflected by the increasing pollen frequency of shrubs. Discussing the economy of the local population, the pollen of *Cerealialia* (cereals), *Secale cerealialia* (rye) and *Fagopyrum* (buckwheat), associated with Poaceae, *Rumex acetosa/acetosella* and *Plantago lanceolata*, suggest that a mixed pastoral/arable land-use existed in the area. The occurrence of *Fagopyrum* pollen is especially interesting, as this pollen grain is still rather rare in this part of the Baltic. The earliest pollen grains of buckwheat in Lithuania, dating from the middle of the 13th century AD, were recorded in Vilnius' Lower Castle (Stančikaitė *et al.* 2008, pp.239-250), which is in good chronological correlation with data from Skomantai, suggesting active trade and exchange.

The further development of the environment, as well as human intervention, is characterised by remarkable changes seen in the pollen record (Fig. 16). Pollen

spectra suggest the reforestation of the area, accompanied by the decreasing intensity of agricultural and pastoral activity. Open fields were overgrown by forests, with birch and alder, and broad-leaved species such as elm and lime. The drop in human intervention recorded may correlate with the destruction of the Skomantai hill-fort in the second half of the 14th century AD (Scriptores 1863, p.664ff). In fact, agriculture and animal husbandry still existed in the area during the later stages of the Middle Ages, which was also confirmed by the presence of archaeological artefacts and historical information and material from burial grounds (Nagevičius 1935a, p.68ff; 1935b, p.70ff; Bliujienė 2011a, p.38ff), though the intensity of these processes decreased remarkably. In explaining the alterations recorded alongside the changes in the local social and political situation, global climatic fluctuations should also be taken into consideration. Climatic changes registered in the different proxies demonstrate that the onset of climatic deterioration called the 'Little Ice Age' (Grove 1988, pp.210-315) was chronologically very similar to the decay in human activity recorded in Skomantai. Thus, the reduction in human activity which occurred at Skomantai during the second half of the 14th century AD may have partly been determined by climatic deterioration as well.

Palaeobotanical data, archaeological records and written sources suggest that ongoing human activity continued throughout the second half of the next millennium AD in the investigated region. Only the Skomantai site lost its importance, and people moved to other places.

Conclusions

Multidisciplinary investigations, that is, archaeological, lithological, sedimentological, palynological, chronological (¹⁴C and thermoluminescence [TL]), geochemical and geophysical, were carried out on the Skomantai archaeological site, allowing us to define the peculiarities of the population history and environmental changes over the last 2,000 years.

Increasing erosion processes dating from the second half of the first millennium BC could be related to the initial stages of the occupation of the hill-fort, while the population of the southeast settlement started in the middle of the first century BC, during the Late La Tène Period, according to archaeological and isotope data. The archaeological artefacts collected, potsherds of grain surface pottery, indicate that members of West Balt Barrow culture settled in the area during the Early

²⁰ For this, see the first part of this article, and footnote 12.

Iron Age. New ¹⁴C and TL information, along with the archaeological record, suggests ongoing cultural activity in Skomantai hill-fort and the settlements at its foot during the Roman Iron Age, when members of West Lithuania Stone Circle Grave culture settled here, as was proven by the occurrence of pottery with a rough surface and ceramics with a smooth surface. During the Migration Period, population activity was concentrated in the foot settlements, whereas the area of the hill-fort was abandoned. The habitation system changed from a fort and settlement system, to a settlement(s) and hill-fort system. Archaeological evidence and isotope data suggest the increasing intensity of human activity in the region, including the resettlement of Skomantai hill-fort during the final quarter of the first millennium AD, that is, during the Viking Age. The Early Middle Ages coincided with extensive human intervention, according to archaeological, palaeobotanical and historical evidence. The land use regime was characterised by an expansion of cereals, including *Secale cerealina* and *Fagopyrum*. However, the regeneration of the woodland cover suggests some reduction in human activity, probably related to the destruction of the Skomantai stronghold in the second half of the 14th century AD. Afterwards, Skomantai was abandoned, and people moved to new habitation sites.

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Abbreviations

AB – Archaeologia Baltica (Vilnius, since 1995; Klaipėda since 2006 –)
AL – Archaeologia Lituana (Vilnius, since 1999 –)
ATL – Archaeologiniai tyrinėjimai Lietuvoje (Vilnius, since 1967)
LAA – Lietuvos TSR archeologijos atlasas, volume III. Vilnius, 1975
LA – Lietuvos archeologija (Vilnius, since 1979 –)
LNM – the Lithuanian National Museum in Vilnius
MAB RS – the Wroblewski Library of the Lithuanian Academy of Science, Archive (Vilnius)
Praeities puslapiai – Praeities puslapiai: archeologija, kultūra, visuomenė. Skiriama archeologo prof. habil. dr. Vlodo Žulkaus 60-ties metų jubiliejui ir 30-ties metų mokslinės veiklos sukakčiai. Klaipėda, 2005.
VAK – the State Archaeological Board (1913–1939)
ŽAM – the Žemaičių Alka Museum

VDKM – the Vytautas the Great War Museum, Archive (Kaunas)

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FAKTAI APIE GYVENIMĄ SKOMANTŲ (VAKARŲ LIETUVA) PILIAKALNYJE IR JO APYLINKĖSE

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Santrauka

Piliakalniai yra išsiskiriantys Lietuvos kraštovaizdžio archeologiniai paminklai, apie kuriuos, nepaisant suintensyvėjusių tyrimų, dažniausiai tebesprendžiame iš išlikusio vaizdo, suponuojančio paskutinį jų gyvavimo etapą. Dažniausiai nedaug žinių turime apie papėdžių gyvenvietes, jų dydį, planigrafiją ir chronologiją. Straipsnyje, taikant kompleksinius nedestruktyvius

tyrimų metodus (palinologinius, geocheminius, sedimentologinius, litologinius, geomagnetinius tyrimus ir radiokarboninį bei termoluminescencinį datavimą) aprašomi tyrimai, vykdyti 2010–2011 m., istoriniai šaltiniai ir neskelbta archyvinė medžiaga, nagrinėjamas Skomantų piliakalnio ir gyvenviečių atsiradimo bei apleidimo laikas, piliakalnio, kaip formuojančio artimiausios teritorijos apgyvendinimo struktūrą, hierarchiniai ryšiai su abiem papėdės gyvenvietėmis, jį supusiais kapinynais ir aplinkiniais paminklais, sudarančiais mikroregioną. Kintant bendruomenės ūkininkavimo modeliui ir visuomenės socialinei struktūrai, kito ryšiai tarp piliakalnio ir gyvenviečių, kaip ir paties piliakalnio paskirtis (1–17 pav. VIII iliustr.). Remiantis minėtais tyrimais ir šaltiniais, straipsnyje nagrinėjama Skomantų komplekso apgyvendinimo raida, apimanti daugiau kaip 1000 metų.

Siekiant rekonstruoti Skomantų archeologinio komplekso raidą, piliakalnio aikštelėje ir pietrytinėje papėdės gyvenvietėje buvo atlikti geomagnetiniai tyrimai, kurie, viena vertus, parodė, kad paminklas nuo seno buvo aktyvios antropogeninės veiklos zonoje, todėl yra apardytas. Nors aišku, kad geomagnetiniai tyrimai, be papildomų archeologinių tyrimų, neleidžia datuoti kultūrinio sluoksnio ir jo suardymų. Tačiau kita vertus, kai kurios rastos anomalijos leidžia jas sieti su buvusiomis archeologinėmis struktūromis. Pavyzdžiui, piliakalnio aikštelėje, plote 1 (MP 1), duobelės išsidėstė eilėmis (stulpavietės), kurios rodytų galimų pastatų vietas. Pietrytinės papėdės gyvenvietės magnetometrinis tyrimas atskleidė, kad nors kultūrinis sluoksnis čia itin apardytas, jame taip pat galima identifikuoti struktūras, kurios gali būti siejamos su gyvenvietėje buvusiomis įvairios paskirties duobėmis, stulpaviečių vietomis, akmenų sankaupomis – kas rodytų gyvenimo žymes.

Skomantų piliakalnis ir vakarinė gyvenvietė buvo tiriami taikant geocheminius tyrimų metodus. Panaudojus rentgeno fluorescencijos analizę ištirta daugiau kaip 200 dirvožemio ir grunto (kvartero nuosėdų) mėginių, paimtų 29 gręžiniuose, cheminė sudėtis. Nustatyti Al, Ba, Br, Ca, Cr, Cu, Fe, Ga, Hf, K, Mg, Mn, Na, Ni, P, Pb, Rb, S, Si, Sr, Th, Ti, Zn, Zr kiekiai. Lygiagrečiai paimtuose mėginiuose buvo ištirtas organinės bei neorganinės anglies kiekis. Išskirti aštuoni cheminiai elementai, susiję su įvairia galima paleoantropogenine veikla, tai: Br, Ca, Cu, Mn, P, Pb, S ir Zn. Didesniosios išvardytų cheminių elementų sankaupos yra aptiktos vakarinėje papėdės gyvenvietėje, lyginant su elementais ir jų kiekiais piliakalnyje.

Skomantų aplinkos žiedadulkių tyrimai rodo, kad buvo išplitę javai (*Secale cerealia* ir *Fagopyrum*). Tačiau remiantis žiedadulkių tyrimais, XIV a. antroje pusėje Skomantų apylinkėse pastebima miškų regeneracija,

kuri gali būti susijusi su Skomantų, kaip mikroregiono centru, apleidimu.

Remiantis radiokarboniniu datavimu bei žinoma ir 2010–2011 m. ekspedicijos metu surinkta archeologine medžiaga (šukės smulkiu kruopėtu paviršiumi), galima teigti, kad Skomantų piliakalnis ir jo artimiausia aplinka, t. y. pietrytinė papėdės gyvenvietė, buvo pradėti apgyvendinti I a. pr. Kr. viduryje ar ankstyvajame geležies amžiuje (La Tène periodas). Šiuo Skomantų apgyvendinimo tarpsniu paminklas skirtinas Vakarų baltų pilkapių kultūros bendruomenėms. Piliakalnis ir abi jo papėdės gyvenvietės romėniškuoju laikotarpiu buvo naudotos Vakarų Lietuvos kapų su akmenų vainikais kultūrinės grupės bendruomenių, naudojusių gruoblėtą ir lygiu paviršiumi keramiką.

Tautų kraustymosi laikais žmonės gyveno pietrytinėje ir, matyt, vakarinėje gyvenvietėse. Tuo tarpu piliakalnio kultūrinio sluoksnio stratigrafija, nustatyta gręžiniais, rodytų, kad aktyvi veikla šiame paminkle buvo nutrūkusi. Nagrinėjant apgyvendinimo struktūros raidą, galima teigti, kad iš Rytų Pabaltijui būdingos romėniškojo laikotarpio struktūros susidariusios piliakalnio ir gyvenvietės (gyvenviečių) simbiozės kito į struktūrą, kurią galima apibūdinti kaip gyvenvietės (gyvenviečių) ir piliakalnio junginį. Archeologinė medžiaga ir radiokarboninės datos rodo, kad Skomantų piliakalnis ir gyvenvietės intensyviai buvo gyvendami vikingų laikais. Skomantų piliakalnis su gyvenvietėmis ir aplinkiniais kapinynais iki pat XIV a. vidurio ar kiek vėlesnio laikotarpio išliko mikroregiono centru.

III

FOOTMARKS
OF THE
EVERYDAY
LIFE OF
SOCIETIES
IN EARLY
URBAN
SETTLEMENTS
AND CITIES