



ARCHAEOLOGICAL EXCAVATIONS ON THE VAULTS OF MIHKLI CHURCH, PÄRNU COUNTY

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INTRODUCTION

Mihkli church is located in Pärnumaa (Pärnu County), approximately 40 km north-west of Pärnu. It is unknown when the limestone building of the church was constructed, but it is mentioned in written sources for the first time in 1359 (LECUB 6, reg. no. 1144). According to art historian Villem Raam the current vaulted church could have been built already in the last quarter of the 13th century (1996, 149–150).

Preparatory work for building a new roof for Mihkli church was carried out in August 2011. They began with the removal of a layer of debris about two or three meters thick that had cumulated on top of the church vaults over centuries. A layer of soil containing human bones appeared under an approximately 1 m thick layer with pieces of roof tiles and mortar. Therefore archaeological excavations financed by the National Heritage Board and led by the authors of this paper were carried out on top of the vaults of Mihkli church.

Already in the beginning of the research it appeared that no complete skeletons were to be found on top of the vaults, because the bones lay scattered and mixed in the layer of soil. They were wound up there together with the soil that had probably been taken from the medieval and modern period cemetery in the vicinity of the church. Pieces of stained glass, probably originating from the windows of the church, were found in the soil on the arches. This hints to the possibility that the soil was taken from the immediate vicinity of the church's outer walls.

Based on current observations we presume that the soil and the bones could have been carried there in the 18th and/or 19th century for unknown reasons. Hypothetically this could have been an attempt to insulate the church. In Estonia the floor of the attic has sometimes been covered with a layer of sawdust or sand for insulation.

NEW DATA ABOUT THE CONSTRUCTION OF THE CHURCH

The removal of the layer of debris and soil from the arches has brought to light new data about the construction phases of the church. The excavations confirmed that before the arches were built, the church was covered with a simple ceiling of wooden beams indicated by the holes discovered in the limestone walls (Fig. 1). Remnants of plaster appeared on the inner walls of the church immediately under the holes for the



Fig. 1. Holes for beams in the southern wall of the church and remnants of plaster revealed under the holes.

Jn 1. Laetalade augud kiriku lõunaseinas ja nende all paljastunud krohvi jäämused.

Photo / Foto: Ain Mäesalu



Fig. 2. One of the windows that had been partly walled in with the construction of the arches, found in the eastern wall of the church.

Jn 2. Võlvide ehitamise käigus osaliselt kinni müüritud aken kiriku idaseinas.

Photo / Foto: Ain Mäesalu



Fig. 3. The excavated passageway and stairs leading on top of the arches in the northern wall of the church.

Jn 3. Müürikäik kiriku põhjaseinas ja trepp võlvi peale.

Photo / Foto: Ain Mäesalu

beams, which shows that already then the interior church walls were plastered. On the eastern wall of the church we discovered two windows, with the size of 70×70 cm that had been walled in during the construction of the arches and must therefore have been part of the older stone-building (Fig. 2). On the western wall of the church we found holes for wooden beams stretching through the walls of the church, which hint to the existence of a balcony or even a possible hoarding on the outer western wall already in the earlier period of the construction.

During the excavations a 2 m long passageway was uncovered inside the northern wall of the church. This also hints to the defensive functions of the Mihkli church. The passageway led to the top of the initial wooden ceiling. Later, with the construction of the arches, limestone stairs were laid on top of the arches (Fig. 3). The aforementioned passage was only accessible from the choir-room of the church through a doorway approximately 4 m higher from the floor. This meant that one had to use a ladder.

There were holes at irregular intervals (1–3 m) through the over 1 m thick wall. These were located 80 to 90 cm lower from the top of the northern and southern walls of the church (Fig. 4). The shape and size of these holes allow us to believe that round logs up to 15 cm thick were placed therein. Their function is unknown. These logs through the walls could have been used to secure scaffolding during a construction phase or they could have supported a wooden hoarding on the outer walls of the church. For example, in 2001 when the Jõhvi church in north-east Estonia was studied, similar holes were associated with a 16th century hoarding (Kadakas 2007, 98–99).



Fig. 4. Holes discovered in the northern wall of the church.

Jn 4. Kiriku põhjaseinas avastatud augud.

Photo / Foto: Ain Mäesalu

THE FINDS

55 finds¹ were gathered in the excavations on top of the arches of the Mihkli church. Some of them were grave goods brought up to the attic along with the soil and the bones. A bronze ring, three iron knives (Fig. 5), an iron belt-buckle and four silver coins are some examples of the finds. A significant find was a ring with a convex/concave middle spiral part made from a strip of bronze. This type of ring was common in Estonia mainly from the 15th to the 17th century, but mostly they have been found in burials from about 1450 to



Fig. 5. Knives.

Jn 5. Noad.

(TÜ 1931: 15, 46, 4.)

Photo / Foto: Ain Mäesalu

about 1630 (Valk 1991, 186; 2001, 49). All three knives represent a type common from the 15th to the 16th century that had flat shafts to which the bone parts of the handle were connected by rivets. One of them, whit decorations on the handle (Fig. 5), is similar to two knives associated with two 16th century women burials found in the rural cemetery of Makita in Tartumaa (Valk 2001, 55, plate XVIII: 14).

The four silver coins² found on the arches of the Mihkli church may also have been grave goods. These include a scherf of Livonian Order, Tallinn (Wolter von Plettenberg), minted after 1515(?); a schilling of the Free town of Riga from 1577; a Swedish schilling, minted in Riga (Gustav II Adolf) from 1621; and another Swedish schilling minted in Livonia (Karl XI) from 1664. In addition a piece of mortar was found in the excavations with an öre of Karl XI minted in Tallinn in 1667 stuck in it sideways.³

26 shards of window-glass, some with traces of painting (Fig. 6), were also found in the soil on the arches. They were probably remnants of the church windows. The rarest of the finds were two book clasps, with an ornament on their surface (Fig. 7). Patches of traces of gilding have been preserved on the surface of the book clasps. These finds are similar to the type of book clasps used in the 16th century.

Three three-ponged sconces produced at the end of the 19th century were found in the holes in the walls located 80–90 cm below the top of the northern and southern walls of the church (Fig. 8). According

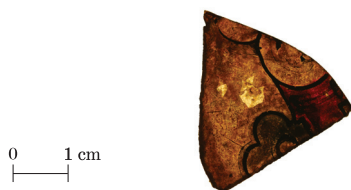


Fig. 6. A shard of window-glass decorated with paintings.

Jn 6. Maalingutega aknaklaasikild.

(TÜ 1931: 32.)

Photo / Foto: Riina Rammo



Fig. 7. Book clasps.

Jn 7. Raamatukaante sulgurid.

(TÜ 1931: 38–39.)

Photo / Foto: Ain Mäesalu

¹ TÜ 1931: 1–55.

² Identified by Mauri Kiudsoo (AD).

212 ³ Identified by Mauri Kiudsoo (AI).

to the local people, the scones were taken apart and hid in these holes in 1943 during the World War II.

OSTEOLOGICAL MATERIAL

Altogether 4029 human bones or their fragments were gathered from the arches of the church. The osteological analysis revealed that ribs and vertebrae formed the majority of bone material; other bones were represented in fewer numbers and frequently as fragments. Wholly preserved long bones (e.g. femuræ and tibiae) and other larger bones, but also hand and foot bones that are quite typical in mixed human remains were absent in this case. Therefore it can be concluded that during the earthworks larger bones were sorted out from the soil. Because picking out smaller parts of the skeletons would have been too time consuming they were carried to the top of the arches with the soil. It is possible that the skeletons were disturbed already before the mentioned earthworks, for example by later burials in the churchyard. Some bones and the soil surrounding them showed traces of fire, probably indicating that the church has been damaged by fire in the past.

Every bone and its location in the skeleton were identified. The minimum number of adults was determined by the most frequently occurred bones (Adams & Konigsberg 2004, 138–151), in this case by the ribs of the right side. Only the ribs with heads were used in calculations. All other fragments were discarded from the calculations, because the determination of the exact number of the ribs using only the fragments is difficult. In total the osteological material from the attic of the Mihkli church consisted of 741 right and 740 left ribs of adults. These numbers were divided by 12 (usually a person has 12 pairs of ribs). This method indicated that there were the remains of about 60 adults among commingled bones.

As the number of the ribs of sub-adults was very small, they cannot be used for determining the minimum number of individuals. Therefore radii, the most frequent parts of the sub-adults skeletons, were used instead. 16 right and 7 left radii were counted, belonging to at least 16 sub-adults. The medieval and early modern cemeteries are often characterized by a large number of sub-adults burials (Kalling 1995; 1997). The scarceness of sub-adults in Mihkli church may be caused by poor preservation, also the smallness and fragility of their bones. However, the possibility that sub-adult burials were fewer in the destroyed part of the churchyard cannot be ruled out either.

Altogether the bones of at least 60 adults and 16 sub-adults were detected in commingled human remains. The analysis revealed that they belonged to men, women and children in all age groups. The osteological material is typical for an ordinary and peacetime cemetery with individuals from all generations.

The pathological analysis of the osteological material ascertained several diseases and traumas, the most common pathologies being connected to ageing, for example wearing of joints (osteoarthritis). Also various diseases related to degeneration of spine were



Fig. 8. A dismantled scone inside a hole in the northern wall of the church.

Jn 8. Osadeks lahtivõetud seinälühter kiriku põhjaseinas olevas augus.

Photo / Foto: Ain Mäesalu

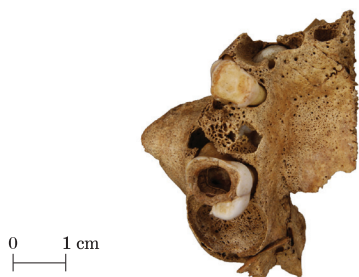


Fig. 9. Right upper jaw of a child with considerable caries on first molar. The longlasting lesion has caused abscess that has also intruded inside the right maxillary sinus.

Jn 9. Lapse parem ülalõualuu, mille esimesel tagapurihambal on märkimisväärne kaaries. Kaugeleulatunud põletik on tekitanud hambajuure mädase põletiku, mis on tunginud ka paremasse põskkoopasse.

Photo / Foto: Kristel Külljastinen



Fig. 10. Lower jaw of an adult male (age 45+ years) with almost all the teeth lost ante mortem.

Jn 10. Täiskasvanud mehe alalõualuu (vanus 45+ aastat), enamik hambaid on eluajal välja langenud.

Photo / Foto: Kristel Külljastinen



Fig. 11. Badly healed fracture in the lower part of the fibula (upper) and a middle-aged male's left humerus with a healed fracture in the lower part (nether).

Jn 11. Halvasti kokkukasvanud luumurd pindluu alaosas (ülemine) ja keskaelise mehe paranenud luumurd vasaku õlavarreluu alaosas (alumine).

Photo / Foto: Kristel Külljastinen

present – spondylosis, spondyloarthrosis and osteochondrosis. Compression fractures (fractura compressiva) and Schmorl's nodes (nodi Schmorl) indicated heavy physical activity or traumas. Schmorl's nodes can also be congenital.

Dental diseases included caries (Fig. 9), alveolar reduction, hypoplasia and tooth abscesses. Several upper and lower jaws showed *ante mortem* teeth loss (Fig. 10). In one case a canine of right mandibula of an adult man (age 45+ years) was formed, but had not been erupted.

Various healed fractures of ribs and limb bones formed the bulk of traumas detected on the bones. Three right ribs had fractures in a stage of healing, but the individuals had died before the complete recovery of the injury. One of the most interesting cases is the left humerus of a middle-aged man with a healed fracture in the distal end (Fig. 11). In addition, a fibula with a healed fracture (Fig. 11) and a talus with osteochondritis dissecans were found. Some bones also wore markers of periostitis that could have been caused by a trauma, infection or physical stress.

Besides diseases and traumas anomalies of bone growth were present in osteological finds. For instance a sacrum with sacralization (fifth lumbar vertebra had entirely fused with sacrum) can be pointed out. Some adults and sub-adults had open suture between frontal cranial bones (suture metopica) while these bones usually unite at the age of 2–4 years (Schaefer *et al.* 2009, 38).

The analysis of the human remains found from the vaults of the Mihkli church gives a valuable contribution on how commingled bones provide information about the health

and lifestyle of a local community. Previously commingled bones have only been used in Estonian archaeology to determine the minimum number of individuals, but they have not been studied more thoroughly paleopathologically. However, even single bones provide direct information about the health and lifestyle of the people in the past, whilst written sources are deficient for this subject.

CONCLUSION

230 tons of soil, pieces of limestone, mortar, tiles and other debris were removed from above the vaults of the Mihkli church. 4029 human bones or bone-fragments, belonging to the skeletons of at least 60 adults and 16 children, were found in the archaeological excavations. The bones were brought to the vaults in the 18th and/or 19th century together with the soil taken most likely from the cemetery around the church. The analysis of the bones gave interesting information on traumas and diseases of the populace that lived in the surrounding area of the church from the 14th to the 17th century. Some of the finds gathered in the excavations were originally grave goods in the burials around the church. All other finds should be connected with the furnishings of the church and are dated between the 14th and 18th (19th?) centuries. The excavations also demonstrated that the original stone church had no arches, but only a simple beam ceiling, plastered from the inside. The two meter long passage inside the upper part of the northern wall of the church revealed that the original church had had a defensive function as well. Research in the Mihkli church has clearly shown the necessity of involving archaeologists when cleaning the attics of old churches.

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ARHEOLOOGILISED KAEVAMISED MIHKLI KIRIKU VÕLVIDEL PÄRNUMAAL*Ain Mäesalu ja Martin Malve*

2011. a augustis hakati Mihkli kirikus seoses uue katuse ehitamise ettevalmistusega eemaldama pühakoja võlvidele kuhjunud 2–3 m paksust prahikihti. Umbes meetripaksuse katusekivide- ja mörditükkide lademe all tuvastati mullakiht, mis sisaldas inimluud. Seetõttu teostati Mihkli kiriku võlvidel arheoloogilisi kaevamisi Muinsuskaitseameti rahastusel ja käesoleva artikli autorite juhendamisel.

Luud paiknesid mullakihis segamini ja terviklikke skelette võlvidelt ei leitud. Ilmselt sattusid luud sinna koos ülesveetud mullaga, mis võeti tõenäoliselt kiriku vahetust ümbrusest, kus paiknes kesk- ja uusaegne kalmistu. Mulla ja luude ülestassimine võis aset leida 18.–19. saj, aga selle tegevuse põhjused pole teada. Ühe hüpoteesina võib kõne alla tulla soov kirikut soojustada.

Kaevamistel selgus, et enne võlvide ehitamist oli kirik lihtsa talalaeaga, millele viitasid paekiviseintes avastatud avaused ja vahetult nende all kirikumüüride siseküljel olevad krohvi jäänused (jn 1). Kiriku idaseinas paljastasid kaks varasemat 70 × 70 cm suurust aknaava (jn 2), mis olid võlvide rajamisega kinni müüritud. Kiriku lääneseina nurkadest avastati läbi müüri ulatuvad puittalade augud, mis viitavad, et lääneseina välisküljel võis juba kiriku varasel etapil paikneda rõdu või koguni kaitserõdu.

Kiriku kaitsefunktsioonile viitab ka tema põhjaseina ülaosas 2 m pikkune käik müüri sees (jn 3). Käigu kaudu sai minna esialgse talalae peale, võlvide ehitamisel tehti sinna lisaks paeplaatidest trepp. Käiku pääses vaid kiriku kooriruumi seinas oleva ukseava kaudu, mis paiknes põrandast 4 m kõrgusel ja ilmselt oli selleks vaja kasutada redelit.

Kiriku põhja- ja lõunamüüri pealispinnast 80–90 cm allpool asusid ebakorrapärase vahedega (1–3 m) läbi seinte ulatuvad augud (jn 4), milles võisid kunagi paikneda kuni 15 cm jämedused ümarpalgid. Pole teada, kas need palgid olid kiriku mingil ehitusjärgul seotud tellingutega või toestasid nad hoopis kirikumüüri välisküljel paiknevat puidust kaitserõdu.

55 arheoloogilise leiu hulgas oli 14.–17. saj matustele iseloomulikke panuseid: pronkssõrmus, kolm nuga (jn 5), pannaal ja 4 hõbemünti. Viies hõbemünt paiknes ühe mördikamaka sees. Ühtlasi leiti 26 aknaklaasikildu, millest osal esines värvise maalinguid (jn 6). Need, ilmselt kirikuakende katked, viitavad võimalusele, et mulda võeti kirikumüüride väliskülje vahetust lähedusest. Lisaks leiti kaks 16. saj iseloomulikku kaunistuste ja kuldamisjäänustega raamatukaante sulgurit (jn 7). Kiriku põhja- ja lõunapoolse müüri pealispinnast 80–90 cm allpool paiknenud seinaukudest leiti 3 kolmeharulist seinälühtrit (jn 8). Need olid sinna peidetud 1943. aastal.

Kokku leiti Mihkli kiriku võlvidelt 4029 inimluud või nende katket. Esindatud olid peamiselt roided ja selgrootülid, vähem oli toru- ja koljuluude fragmente. Kuna ühtegi tervet toruluud (nt reie- või sääreluud) ei leitud, siis võib järeldada, et isikud, kes pinnast kaevasid ja võlvidele viisid, noppisid suuremad luud välja. Mõistatuslikuks jäi aga käe- ja jalalabaluude väga väike hulk.

Luude seas kõige arvukamalt esinenud roiete analüüs andis täiskasvanute väikseimaks indiviidide arvuks vähemalt 60. Alaealistele kuulunud parema poole kodarluude järgi oli minimaalne laste arv 16. Tavaliselt on kesk- ja varauusaegsetel kalmistutel lastematuste osakaal suurem.

Mõningate inimluude põhjal õnnestus tuvastada omaegsete inimeste haigusi ja traumasid. Peamisteks olid vananemisega kaasnevad haigused nagu näiteks liigeste kulumine ehk osteoartritis. Esines ka selgroo degeneratsiooniga seotud haigusi nagu selgrootülikehade kulumist ehk spondüloosi ja selgrootülide liigeste kulumist ehk spondüloartriti. Raskele füüsilisele koormusele või traumadele viitasid selgrootülide vaheketaste songad selgrootülikehadel. Lisaks esines märke ka periostiidi ehk luuümbrise põletikust. Hammastega seotud haigustest esines kaariest, igeme põletikku, hambaemali mineralisatsioonihäiret ja hambajuure tipu mädast põletikku ehk abstsessi (jn 9). Mitmel üla- ja alalõual oli näha eluajal väljakukunud hammaste sulgunud hambasompe (jn 10).

Peamisteks traumadeks olid luumurrud. Enam kohtas paranenud roiete murrusid. Samas tuvastati kolm paremat roiet, millel oli murru piirkonnas näha paranemise algust, kuid inimene oli enne lõplikku paranemist surnud. Haruldaseks leiuks oli ühe keskealise mehe vasak õlavareluu, millel võib märgata paranenud luumurdu (jn 11). Lisaks oli ühe täiskasvanu pindluu paranenud murruga (jn 11) ja ühe täiskasvanu vasakul kontsluul oli traumast tingitud lõhestuv osteokondriit.

Kokku eemaldati Mihkli kiriku võlvidelt umbes 230 tonni mulda, mördi- ja katusekivide tükke ning muud prahti. Sellega kaasnenud arheoloogilistel kaevamistel kogutud materjalid pakkusid uusi andmeid kiriku vanema ajaloo, aga ka ümbruskonnas elanud inimeste tervislikust seisundist. Uurimistööd näitasid selgelt, et vanade kirikute põõningute puhastamisel on arheoloogide kaasamine igati vajalik.