ANIMAL REMAINS FROM THE LATE MEDIEVAL CASTELLUM OF ŐCSÉNY-OLTÓVÁNY, SOUTHERN HUNGARY

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INTRODUCTION

Archaeozoology is devoted to the identification, analysis, and interpretation of animal remains from archaeological sites. The reconstruction of everyday life in the medieval period has become unimaginable without considering archaeological phenomena, as emphasis tends to be placed on outstanding events and personalities at the expense of the simple matters of life that characterized daily practices even in well-documented situations. It is especially challenging to investigate whether medieval documentary sources match the evidence of archaeological animal bone assemblages. Moreover, such written sources are frequently missing and the study of artefactual remains is the only way medieval daily life can be understood.

This study is the summary of meat consumption and animal use at the late medieval site known today as Őcsény-Oltóvány in Tolna County, Hungary. The only written reference to the castle of Györke that once stood at this location is indirect (castellanus castelli Gywrke), originating from a 1446 legal document supporting the typochronological dating of the archaeological finds covering the time interval between the period of the Árpád Dynasty (ending in 1301) and the beginning of the Ottoman-Turkish occupation of Hungary in 1526 that probably also marked the end of the small castle’s history.¹

LANDSCAPE, ENVIRONMENT, AND EXCAVATIONS

The site called Oltóvány was discovered some half a kilometer north of the edge of present-day Őcsény, a village in southern Transdanubia, Hungary. In a broad sense, the site is located near the ecotone between the Transdanubian hill region and the floodplain of the Sió River, a major right bank tributary to the Danube. The castle lay in the plain below the 100 m contour line above the Baltic sea level (Fig. 1). The immediate region around Őcsény-Oltóvány is called Sárköz, a name which in Hungarian refers to mud, i.e. the marshy nature of the floodplain habitat which developed on the top of tens of meters of windblown loess deposited on the sandy-gravelly substrate of the Palaeo-Danube River during the Pleistocene. Today, this is a monotonous landscape with only traces of oxbows, natural levees, and terraces reminiscent of the surface prior to the 1881–1885 river regulation works along this section of the Danube.

¹ This paper is dedicated to the memory of Zsuzsa Miklós (1948–2014), leader of the excavation of the site, who entrusted me with the analysis of this find material. Her monograph on the castles of Tolna County was published only in Hungarian and is quoted extensively in this chapter to offer an archaeological background to my own faunal investigations. Figures 2, 3, 7, and 8 were taken from her work (Miklós 2002) with the publisher’s kind permission. The final manuscript was prepared within the framework of OTKA Grant No. K 72231 of the Hungarian Scientific Research Fund.
The medieval environment may thus be characterized as a wetland with arable terraces in the floodplain zone.

According to detailed archaeological surveys, within this flat area the site occupies heights between 86–91 m asl, with the actual remains of the castle once built on a ca. 3 m high elevation (91 m asl) stretching along the left bank of the Báta Stream (Fig. 2). The castle once faced the northern edge of a peninsular area surrounded by this stream. Today, Báta Stream is part of the Szekszárd-Báta main channel, a strongly eutrophic small river, whose course seems to have changed little, at least during the past three centuries.

According to an 1888 description by Frigyes Pesty, “there is a place demarked by a broad rampart with ruins of a building where, according to folklore, the lady friend of the Szekszárd pasha lived during Ottoman times. … The popular name of the road the pasha had built across the then marshy space is called Devil’s stretch even today, perhaps due to the great hardships suffered during its difficult construction.” Although the rampart later turned out to have been of Roman origin, Pesty’s vivid description of the toponym gives a reliable impression of the landscape before the river regulations.

Having interviewed local dignitaries in Tolna County during 1891 regarding potential archaeological sites, archaeologist Mór Wosinsky visited Oltovány himself. In addition to the features visible today, he had also observed an external moat (Fig. 3), which had largely disappeared by the 1950s.

The site was again identified by Zsuzsa Miklós in 1977. The habitation area of the medieval castle covered some 30 m by 30 m along the stream and was surrounded by a 4 m deep and 10–15 m wide, semi-circular moat at the time. Beyond the moat, the remains of a 15–20 m wide and 100–150 cm high earthwork were recognized. The survey continued in 1985 before the interior of the castle was excavated by a team of the Archaeological Institute.

2 PESTY 1888.
3 WOSINSKY 1896.
Figure 2. The topographic position of the site based on field surveys by Gyula Nováki and György Sándorfi (1985), and Endre Egyed (1991) (after Miklós 2002)
of the Hungarian Academy of Sciences under the direction of Zsuzsa Miklós. Work began by opening test trenches in the centre in 1988. During 1990–1992, almost the entire internal territory was excavated, revealing five houses of various structures, refuse pits, and remains of the inner palisade, all dated to between the fourteenth and sixteenth centuries. According to the 1992 excavation results, the inner moat was 4.6 m deep relative to the level of the inside habitation area. Remains of palisades were also identified along both Báta Stream and the defensive ditches.

THE ANIMAL BONES

Excavations at the site brought to light 2,662 pieces (70 kg) of remarkably well-preserved animal bones, the overwhelming majority (ca. 90%) originating from domestic animals. Due to the relatively small degree of fragmentation, most of the bones were identifiable to species, fewer than 300 fell into the generic “small” or “large ungulate” categories denoting sheep/goat (caprine) or pig, and cattle or horse or red deer, respectively. The share of non-identifiable material was 10% in terms of fragment numbers; however, these unrecognizable bone fragments contributed far less to the material in terms of bone weight due to their small sizes (average weight < 20 g).

Figure 3. The plan of the site published by Mór Wosinsky in 1896 (after Miklós 2002)

Figure 4. Differences between the proportions of main livestock species (100%) in terms of the numbers of identifiable specimens (NISP) and bone weights

Miklós 2002.
Water-sieving or at least dry screening is a precondition for the statistically representative recovery of bones from smaller vertebrates such as birds or fish. Nevertheless, refined techniques of recovery are almost unknown in medieval archaeology in Hungary. Consequently, it is only the largest fish species such as sturgeons, whose bones can be occasionally studied from medieval sites. Despite the alluvial environment of the fortified castle, no fish bones were found in the Oltovány assemblage and only two wild bird bones (weighing only ca. 3.5 g each) could be recovered by hand collection. It became clear already during the first inspection that the animal remains from the site represented food refuse, many originating from meat-bearing regions of the animal carcasses, damaged by marks of both primary and secondary butchery, usually identifiable as left by high quality metal tools. The taxonomic composition of the material is listed in Table 1 by the number of identifiable bone specimens (NISP) and bone weights. The percentual contribution of main domesticates (cattle, pig, caprines) by these two parameters are summarized in Figure 4. While the number of fragments was evenly distributed between pig and cattle (caprine remains making up only one quarter), bone weights suggest that over half of the meat consumed in the castle must have been beef. This means that while pig remains dominate in the assemblage in terms of absolute fragment numbers, when bone weights are taken into consideration it is evident that approximately twice as much beef was consumed at the site as pork. Meat from caprines was evidently far less significant, as shown by both the relatively small number of identifiable fragments and their small summarized weights. Although sheep and goat are different species, their bones are hardly distinguishable (with the exception of skulls, horn cores, and metapodia). Even though goat is more tenacious and gives a higher amount of milk compared to its body size, sheep bone is usually found more commonly in Hungary. As may be observed at Oltovány Castle as well, there are usually at least 3–4 times more bones from sheep than goat among the precisely identifiable caprine remains, a ratio characteristic of many medieval sites in Hungary.

Horse bones occur scarcely in this assemblage, clearly indicating that this species did not contribute to the meat supply of the castle. At late medieval sites, horse carcasses were processed for manufacturing purposes only: fine cut marks on the bones of the feet often testify to the use of the hide. Horse metapodia were frequently carved due to their strength and straight shape. Bone “skates” or runners occurred commonly until the twentieth century. In the absence of such activities, however, there was no reason to bring body parts of horses into the castle’s area.

Dog meat was not consumed either and, therefore, remains of this animal had a smaller chance of ending up in the archaeological material mainly consisting of kitchen refuse. Dog carcasses are thus likely to be discovered intact and in anatomical order. The very few dog bones at the site, however, were disarticulated and probably represent secondary deposition. Medieval attitudes towards dogs were ambiguous: they were symbols of both loyalty and envy. However, by the late medieval period, luxury dogs also became important symbols of social status across Europe, and therefore they must have been present at settlements, especially where hunting was pursued. This hypothesis is strongly supported by the relatively high number of bones in the kitchen refuse gnawed by dogs which must have scavenged on food remains even within the relatively limited area of the castle.

Domestic hen was the main type of fowl kept at almost all medieval settlements. Domestic goose is found only sporadically and, in addition, its bones are usually impossible
to distinguish from those of the wild ancestor, greylag goose, inhabiting similar marshy habitats. The domestic status of this bird is, therefore, usually assumed on the basis of domestic animals in general dominating in medieval faunal assemblages. Sources describing the selection of geese by color in thirteenth-century Hungary\(^\text{10}\) attest to the importance of this species.

Wild pig and red deer are best represented among large game. Animals of this size need a good cover, and therefore they are indicative of forested areas in the relative proximity of the settlement. This is not surprising, as much of the alluvial plain around the site must have been covered by floodplain forests.

The importance of domestic pig and the presence of wild boar in the faunal list of Oltovány Castle raise questions concerning the form of pig keeping. Until recently, pigs have often been herded in woodlands. This practice was aimed at both seasonal feeding on acorn and spontaneously upgrading domestic stock by wild boars. This possibility was studied by looking at the size of the bones from the site. Although no complete long bones

\(^{10}\) Matolcsi 1975, 216.
of pig were recovered from Oltovány Castle, withers height estimates could be based on the greatest lengths of astragali and calcanei. In spite of the small number of cases, the results show a near-normal distribution, with only two individuals approaching a stature of 80 cm, possibly boars (Fig. 5, top). However, the rest of the individuals were relatively large as well.

Measurable bone fragments (especially the early fusing distal epiphyses of humeri and tibiae) occurred in slightly greater numbers than the bones used in estimating withers heights. They could be visualized against the backdrop of the measurements of ten present-day female wild boars collected near Kızılcahamam in Anatolia, Turkey. It is important to note that the mean values and standard deviations of this reference sample suggest no biological connections between the two sets of bones, but help to appraise variability in the set of medieval pig bones in Hungary.

Pig bone measurements from Oltovány Castle were converted into standard scores using the mean values and standard deviations of the wild boar measurements from Kızılcahamam and plotted in a histogram whose zero value corresponds to the average of modern female wild boar (Fig. 5, bottom). The overwhelming majority of measurements taken in the Oltovány material fall left of the average of Anatolian wild sows, showing that most of these animals represented domestic animals. Some small bones in the far left (standard score< -6) may originate from not fully mature individuals whose early fusing epiphyses could not be precisely aged in the absence of the evidently young, unfused half of the same bone. In Figure 5 (bottom), only five of the largest bones from Oltovány Castle exceed the

11 Teichert 1969.
average measurements of modern female wild pig (0 value). The majority cluster between the distances of -1 to -5 standard deviation from this wild female mean. These measurements represent rather large, but probably domestic pigs. The few largest bones (standard scores>0) probably originate from wild boar. The small contribution of the latter form to measurable bones is consistent with the morphological identification by which the proportion of wild boar to domestic pig was 78:827 in the Oltovány assemblage (Table 1), that is only 8.6% of all suid bones could be identified as originating from wild pig. Otherwise, the presence of relatively large (domestic) individuals raises the possibility of mixing with local wild stock. In wetland habitats, rhizomes of reed and aquatic mollusks could be profitably utilized by freely foraging pigs. Due to this widespread practice, medieval pigs in many parts of Central Europe were considered in-between domestic and wild both genetically and conceptually. According to medieval sources in Poland, “swamp hogs” resembled wild boar in flavor, but were considered livestock.13 Wild boar is followed by Eynheimisches Schwein in the cookbook of the Mainz Elector.14 Therefore, “native pig”, distinguished from wild boar and translated as forest hog by János Keszei in the cookbook compiled for Anna Bornemisza,15 is of special interest. Keeping free-ranging pigs in the forests of Šumadija in Serbia was a historically important phenomenon.16

Beaver – an aquatic mammal having scales on its tail – was often considered “fish” and eaten during Lent.17 Beaver bones were brought to light at this site as well. Their presence is unsurprising from an environmental point of view, given the marshy habitat surrounding the castle of Oltovány. It must be noted, however, that such delicacies eaten at medieval centers usually signify that rather the letter than the spirit of Lent was kept by the élite striving for both varied food and self-representation. In Transylvania, beavers were kept in captivity for both their meat and pelts in the sixteenth century.18

The bones of hare are interesting from an environmental point of view, as these animals (together with roe deer) prefer drier bushland such as the forest edge and natural vegetation covering levies in the floodplain. Their presence in the diet confirms our hypothesis that the medieval wetland environment was mosaic-like, interspersed with patches of higher, arable elevations.

Modern-day individuals of burrowing carnivores such as fox and badger may have ended up in the archaeological bone assemblage by dying in their burrows. In such cases, the only evidence supporting a medieval dating would be the signs of human alteration such as skinning marks. Such marks, however, could not be identified on the few badger and fox bones recovered at Oltovány.

Meat provisioning at the castle

The animal bones from Oltovány Castle represent a group of assemblages that originate from fortified sites of distinctly non-agrarian character, where possibilities for animal keeping were spatially limited. Meat supply to castle dwellers depended on food production in nearby villages and market towns (such as Decs, lying 4 km south of Oltovány, that coexisted with the castle through most of its medieval history). Remains of a fourteenth–

14 Rumpolt 1581.
15 Lakó (ed.) 1983.
16 Halpern 1999, 83.
17 Bartosiewicz et al. 2010.
18 Bejenaru 2003, 156.
sixteenth-century rural settlement were also detected opposite the castle on the right bank of the Báta Stream. The meat supply of such settlements was often organized in a way that the animals for slaughter would be driven to the complex on foot before they were killed, and primary butchery into portable carcass parts may have taken place outside habitation areas. The anatomical distribution of bones by weight shown in Table 2 illustrates this possibility.

Focusing on the most important species of livestock, cattle, pig and caprines, interesting trends of differential selectivity may be observed. When percentages of bone weight are compared to that of a complete skeleton in each species, the relatively high weight proportions of *stylopodium* bones (humerus and femur) and scapula are evident among the pig remains (Fig. 6, top). These meat-rich extremity segments of proximal location correspond to valuable cuts commercially termed “shoulder” and “ham”. This marked patterning seems to have been indicative of specialized carcass treatment since prehistoric times, including the transport of cured (salted and smoked) pork to the castle. Mandibles also stand out in this comparison. The sizeable masseter muscle, associated tongue, and even the marrow content of the pig mandible represent food value.

Cattle remains show a different tendency. Bone weights of high-quality meat-bearing regions of the trunk (vertebrae, scapula, ribs) and humerus are relatively overrepresented in the material (Fig. 6, middle). This pattern is indicative of the strong possibility that selected sections of cattle carcasses were taken into the castle during most of its history and less valuable skeletal parts were often left behind at the kill site outside. The pattern obtained for cattle is almost the diametric opposite of skeletal part distributions characteristic of tanneries where the least valuable carcass parts (dry limbs

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**Table 2. The anatomical distribution of identifiable bone weights in the most important meat purpose species**

<table>
<thead>
<tr>
<th>Skeletal element</th>
<th>Pig</th>
<th>Cattle</th>
<th>Caprine</th>
<th>Horse</th>
<th>Red deer</th>
<th>Roe deer</th>
<th>Wild pig</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skull</td>
<td>2,956</td>
<td>150</td>
<td>1,331</td>
<td>12</td>
<td>46</td>
<td>95</td>
<td></td>
</tr>
<tr>
<td>Mandible</td>
<td>1,699</td>
<td>225</td>
<td>942</td>
<td>272</td>
<td>75</td>
<td>225</td>
<td></td>
</tr>
<tr>
<td>Vertebræ</td>
<td>2,651</td>
<td>9,271</td>
<td>1,521</td>
<td>368</td>
<td>171</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ribs</td>
<td>1,691</td>
<td>6,841</td>
<td>607</td>
<td>176</td>
<td>25</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Scapula</td>
<td>868</td>
<td>3,662</td>
<td>572</td>
<td>232</td>
<td>95</td>
<td>214</td>
<td></td>
</tr>
<tr>
<td>Humerus</td>
<td>1,690</td>
<td>5,241</td>
<td>584</td>
<td>427</td>
<td>372</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Radius/Ulna</td>
<td>1,078</td>
<td>1,142</td>
<td>462</td>
<td>212</td>
<td>228</td>
<td>161</td>
<td>311</td>
</tr>
<tr>
<td>Metacarpus</td>
<td>439</td>
<td>1,845</td>
<td>214</td>
<td>95</td>
<td>22</td>
<td>31</td>
<td></td>
</tr>
<tr>
<td>Pelvis</td>
<td>859</td>
<td>595</td>
<td>241</td>
<td>287</td>
<td>12</td>
<td>68</td>
<td></td>
</tr>
<tr>
<td>Femur</td>
<td>1,380</td>
<td>3,326</td>
<td>925</td>
<td>252</td>
<td>276</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tibia/Fibula</td>
<td>1,225</td>
<td>482</td>
<td>662</td>
<td>319</td>
<td>188</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Basipodium</td>
<td>822</td>
<td>204</td>
<td>58</td>
<td>128</td>
<td>38</td>
<td>71</td>
<td></td>
</tr>
<tr>
<td>Metatarsus</td>
<td>415</td>
<td>741</td>
<td>346</td>
<td>163</td>
<td>111</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Phalanges</td>
<td>504</td>
<td>972</td>
<td>107</td>
<td>121</td>
<td>138</td>
<td>11</td>
<td>73</td>
</tr>
<tr>
<td><strong>Total weight (g)</strong></td>
<td><strong>18,277</strong></td>
<td><strong>34,697</strong></td>
<td><strong>8,572</strong></td>
<td><strong>333</strong></td>
<td><strong>3,097</strong></td>
<td><strong>460</strong></td>
<td><strong>2,231</strong></td>
</tr>
</tbody>
</table>

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22 van Wijngaarden-Bakker 1990, 170.
Figure 6. The anatomical distribution of bone weights compared to standard skeletal weights of pig, cattle, and caprines. For raw data, see Table 2
and heads) tend to be overrepresented.\textsuperscript{23} Bones of the head (both the \textit{calvarium} and mandibles) are practically missing from the Oltovány cattle assemblage. The relatively small weight of caprine bones (representing both sheep and goat without distinction) seems to support the hypothesis that the skeleton of small stock is more evenly represented in the food refuse recovered from within the castle’s habitation area (Fig. 6, bottom). Although beef played a crucial role in medieval diet in Hungary, inside the earthworks there was simply no room for pasturage. Only animals suitable to be confined to small places (domestic fowl, dogs, and perhaps pigs) could have been kept inside such complexes. Grazing even small bovids within the enclosure would have been out of the question and even pig keeping (a more household-bound form of animal husbandry) would have been similarly impossible on a larger scale. The settlement should be seen as a site of consumption rather than of production.

Undoubtedly, the carcasses of non-meat purpose animals such as horses or dogs were dumped into the moat or disposed of/buried outside the limited inner castle area. As is usual with food refuse, the bones recovered within show signs of heavy butchering, including evidence of hacking that damaged many of the usually measurable bones. Cattle astragali were split lengthwise as seen at other sites;\textsuperscript{24} in one case, the \textit{sustentaculum calcanei} was probably also hacked off with the same move. In several cases, the lateral side of the \textit{trochlea humeri} was similarly cut off, precluding bone measurement. Cut marks indicative of defleshing or food preparation were visible on mandibles and ribs. On the other hand, no marks of skinning could be identified, in part due to the relatively small number of autopodium bones in the assemblage. In the absence of completely preserved long bones, the stature of the animals could not be estimated.

\textsuperscript{23}Bartosiewicz 2009.
\textsuperscript{24}Bartosiewicz 1995.
The approximately 30 m by 30 m habitation area of the castle corresponds to less than 10% of a hectare. Although somewhat larger dimensions are given in Wosinsky’s 1896 drawing (Fig. 3), in addition to possible inaccuracies in his method of measurement, the edges of the elevation have indubitably been eroded by over a century of tillage. Even during the settlement’s life, however, the internal living space must have been quite limited. The maximum extent of the living space was delineated by the defensive moat. Water must have been diverted from the Báta Stream into the possibly double enclosure system (Fig. 7). These spatial parameters help putting the concentration and qualitative composition of the animal bone assemblage into perspective. The leader of the excavation, Zsuzsa Miklós, a skilled aerial photographer, took advantage of a nearby agricultural airfield and prepared a near-daily documentation of the excavation from the air. Features shown in these pictures offer a glimpse of how crowded the core area of the castle may have been (Fig. 8). Although it is impossible to estimate the potentially oscillating number of inhabitants on the basis of animal remains, the high status of at least some of the quarters is indicated by numerous glass shards, several of them originating from thirteenth–fourteenth-century workshops in Venice, and fragments of elaborate, unglazed openwork stove tiles.

Age distributions and pathological lesions

Ageing the animal remains from Oltovány was carried out by a combination of tooth eruption sequences and epiphyseal fusion data in present-day domesticates derived from reference animals of known ages. However, given the different ossification regimes of epiphyseal plates in various long bones, only the terminus post quem absolute ages of animals could be established, a potential source of distortion seldom addressed in the literature. This means that calendar ages at death may look different in the sample depending on the skeletal part available for study. Relative frequencies (NISP per cent) of ageable skeletal elements at medieval Oltovány indicate well-known differences between species rooted in their patterns of exploitation (Fig. 9). Longevity is most characteristic of cattle; even some bones of very old individuals could be identified. Cattle are not slaughtered easily: this is a consequence of their slow reproduction and exploitation for dairy products as well as their potential use in traction. Single meat purpose pigs represent the other extreme: a prolific, multiparous animal whose numerous offspring can be slaughtered for meat even at young ages, but certainly by adulthood, aside from some individuals retained for further breeding. Caprine age profiles (including those of clearly identifiable sheep and goat) fall in-between those of cattle and pig. This may also be related to their secondary exploitation for wool and milk, respectively. These renewable resources can be harvested for several years, before a sheep or goat is killed for meat. Note that the general “caprine” group includes numerous bones from young individuals whose species identification is impossible exactly because of their young ages. This high proportion of young animal bone is an indication of observer bias rather than a sign of special exploitation.

In spite of the rather large size of the assemblage, only two cases of pathological lesions were recorded, both in the case of cattle. This is related to the fact that the remains of mature individuals dominated among cattle bone, as age is a major disposition to a number of

26 Miklós 2002, 288, Fig. 275.
27 Guilday 1970.
28 Bartosiewicz et al. 2013, 104, Table 1.
pathological conditions. In addition to natural aging, the probability of cumulative trauma is also greater as time advances.

An acetabulum pelvis fragment displayed eburnation on the caudal articular surface (Fig. 10). Eburnation is one among the composite of at least three simultaneous symptoms of advanced arthropathy. This ivory-like glossy wear results from the surfaces of the two epiphyses grinding on each other once the protective cartilage cover is gone from the joint surfaces, a symptom especially common in the hip joint of cattle. The innervation of the epiphyseal surface is poor and spectacular polish develops following the most painful, acute phase of inflammatory soft tissue degeneration.

Pathological fusion (ankylosis) was observed between the centrotarsal bone and the naturally fused 2nd and 3rd tarsal bones in the hock joint of a small cow (Fig. 11). A study of 88 cases of cattle spavin from medieval Schleswig-Schild has shown that ankylosis usually begins in-between these two bones of pivotal location before it spreads to the entire tarsal joint. A series of tarsalia showing the advancement of this process in fourteenth–sixteenth-century cattle is known from the Netherlands. Details have further been investigated using magnetic resonance imaging in present-day draught oxen from Romania, demonstrating that degenerated arthrotic bone is first replaced by non-calcareous bone, especially in the centrotarsal region. The sclerosis of this matter is instrumental in the fusion between the affected bones, first in the weight-bearing dorso-medial region of the joint where the ankyloses in both the Oltovány specimen and the modern ox could be observed. Therefore, the Oltovány case may be considered the incipient phase of spavin. Its causal relationship with draught exploitation, however, remains uncertain.

30 Bartosiewicz 2013, 108.
31 Hüster 1990, 44.
32 Davis 1987, 162, Fig. 79.
By the medieval period, mundane bone and antler working was largely overshadowed by easily available iron artifacts. The remaining types of worked bone and antler usually served as parts in composite equipment or as decoration. Two knives found at the site probably had handles made from bone, as is suggested by their shape and good preservation (in contrast to wood), although I had no opportunity to study these objects myself. Two objects made from red deer antler, however, were discovered among the refuse bones available for direct inspection. One of these is a damaged crossbow nut showing signs of heavy use, including a split segment (Fig. 12). It is a stout, cylindrical object with a semilunar incision made to hold the string in a tensed position. This function exerts a major strain on the nut. Due to its special, homogeneous texture (as opposed to skeletal bone of a more lamellar microstructure), the robust base of red deer antler was a preferred raw material for these artifacts. The particularly dense antler of European elk was especially highly valued for this purpose. Crossbow nuts are relatively common finds across Europe, including Hungary. Among others, several sixteenth–seventeenth-century specimens have been reported from

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34 Miklós 2002, 289, Figs. 277/2–3.
35 Bartosiewicz 2008a.
37 MacGregor 1985, 159.
both the Citadel and Lower Castle of Visegrád.\textsuperscript{38} The military use of crossbows is indirectly supported by other finds of weaponry at Oltovány: aside from utilitarian metal objects, fragments of armor, a lance head and – most importantly – the tip of a bolt were also recovered in the fort.\textsuperscript{39}

The other piece of worked antler is represented by two similar fragments, far more difficult to interpret. These are two, slightly curved, cigarette-size fragments of semi-circular cross-section. One of the fragments has a hole bored into it that retained the small fragment of an antler rivet, once used for fastening. One can only speculate that these pieces formed a rim or edge-cover of some sort. Following soaking in mild acidic liquids, properly softened antler strips can be bent into complex shapes, such as the decorative framing of hem on saddles\textsuperscript{40} or high-status upholstery. Due to its rigid, lamellar structure, skeletal bone would be far less fit for this purpose, but antler could be bent into shape after having been soaked even in water.

\textbf{INTRA-REGIONAL COMPARISONS}

Oltovány Castle forms the easternmost point of a largely equilateral triangle with two other castles with known medieval animal remains. Murga-Schanz (northwest of Ócsény)\textsuperscript{41} and Váralja-Várão (southwest of Ócsény),\textsuperscript{42} however, are not only dated to the earlier period of the Árpád Dynasty (the thirteenth century), but they are also located among the rolling hills that form a semicircle around the Sió floodplain. Since the distances between the three castles are only some 35–38 km, these fortified settlements formed a unit of comparable sites, despite the chronological difference. The timber fort of Szekszárd-Palánk, on the other hand (although located only 5 km northwest of Ócsény-Oltovány in a very similar marshland environment), already represents the Ottoman-Turkish occupation during the sixteenth–seventeenth centuries.\textsuperscript{43} Animal remains from these sites are summarized in Table 3.

There are evident differences between the contributions of major meat species to these assemblages. According to the percentage contribution to the number of identifiable bones (Fig. 13), cattle seems to have been the most important domesticate in terms of fragment numbers at many of the later sites, providing not only beef, but also dairy products and draught power as well as bone and leather used in craft industries. Forms of secondary exploitation and industrial hide processing, however, were unlikely to have taken place at a large scale in the castles themselves. Although no weight data are available from the sites

\begin{figure}
\centering
\includegraphics[width=0.5\textwidth]{damaged_crossbow_nut.png}
\caption{Damaged crossbow nut made from red deer antler (photograph by Krisztina Pálfay)}
\end{figure}

\textsuperscript{38} Kováts 2006, 187, 9–10; Kováts 2009, Fig. 8.
\textsuperscript{39} Miklós 2002, 288, Figs 276/1–2.
\textsuperscript{40} This possible analogy is supported by a contemporary peasant saddle housed in the ethnographic collection of the Móra Ferenc Museum in Szeged, Hungary.
\textsuperscript{41} Gál 2004, 245.
\textsuperscript{43} Bartosiewicz 1995.
László Bartosiewicz

used in this comparison, a strongly selective deposition of bones from meat-bearing parts is a remarkable observation at Oltovány.

Sheep and goats could be exploited for their meat, milk and wool outside the castles, but mutton was consumed in higher proportions only at some Árpád-period and Ottoman-period forts and castles. Pork seems to have dominated in terms of fragment numbers at settlements where less beef was consumed, although the example of Oltovány Castle shows that such numbers could be misleading in the light of bone weights, more closely correlated with the quantities of meat.

The multiparous and omnivorous nature of pigs made them an ideal backyard animal at settlements confined to limited spaces such as the enclosure of Oltovány Castle. Poultry, especially hen keeping, required minimal labor, while it also provided eggs and feathers that could be utilized by the inhabitants of the castle.

The statistically significant differences between assemblages persist even when the remains of cattle, pig and caprines are compared within the “triangle” of the geographically closest medieval sites (Table 4).

The distribution of the three animal groups shown in this table is not homogeneous (Chi²=12.539, P=0.014, df=4) due to the smaller proportion of caprines and the greater share of pig bones in the relatively small Árpád-period assemblage from Murga-Schanz, originating from the hill region. This may be, however, a random difference related to assemblage size, as no statistically significant difference was found between the proportions of these animals at Öcsény-Oltovány and Váralja-Várffő, in spite of the fact that the latter assemblage also represents the period of the Árpád Dynasty in the hill region. The percentages of bones
originating from beef and pork are similar (ca. 38% at both sites), while the contribution of caprine bones is less than a quarter in this sub-set of animal bones. Bone weights (Fig. 4) show the unquestionable dominance of beef in the meat diet.

In sharp contrast to widespread topos, the consumption of horse meat is not known to have been explicitly prohibited by the Catholic Church in medieval Hungary. This widely held belief is at least partly rooted in an eighth-century ban by Pope Gregory III, recorded long before Hungarians even settled in the Carpathian Basin. It is, nevertheless, unlikely that the few horse bones excavated at late medieval forts had been deposited as food refuse. Horse flesh consumption in Hungary declined following the mid-thirteenth-century appearance of western settlers after the Mongol invasion. Aside from this historical turning point, horse meat seems to have been more popular in the Great Hungarian Plain, possibly under more direct eastern influence. The forts of Szabolcs-Földvár and Mende-Lányvár, inhabited during the period of the Árpád Dynasty, fall in this category. The custom survived especially in villages of the Great Hungarian Plain (eastern Hungary, e.g. Debrecen-Tócó-part, Tiszalók-Rázom, Kardoskút-Hatablak, Gyál 13, and Hajdúnánás-Fürjhalom). The animal bone assemblage from Oltovány is in sharp contrast with this historically earlier trend.

Although game constituted only a small part of the meat diet at most medieval forts and castles in Hungary, it was included in Figure 13 instead of horse, as hunting seems to have been practiced by the inhabitants of high-status sites more often than by common people inhabiting the known medieval villages. Bones of wild boar, red deer, roe deer, and hare are usually found at medieval centers. At the Árpád-period bailiff’s centre of Szabolcs and the town of Esztergom, remains of European bison were discovered, indicative of probably organized hunting by the aristocracy.

The general characteristics of animal exploitation in castles are clearly recognizable in most of the assemblages; nevertheless, it is hard to reconstruct the precise proportions between the species. Domesticates prevail in all cases, but their ratio varies. Even though there is a general assumption that in the late medieval period the number of sheep and goats gradually decreased as pork became more important in the diet, the trend is not yet strongly pronounced at the two earlier medieval castles forming the aforementioned triangle with Ócsény-Oltovány.

### Table 4. The contribution of meat-producing livestock to the diet of three medieval sites in Tolna County

<table>
<thead>
<tr>
<th>Site (NISP)</th>
<th>cattle</th>
<th>caprine</th>
<th>pig</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Murga-Schanz (567)</td>
<td>36.0</td>
<td>18.8</td>
<td>45.2</td>
<td>100.0</td>
</tr>
<tr>
<td>Váralja-Várfa (1343)</td>
<td>38.8</td>
<td>21.9</td>
<td>39.3</td>
<td>100.0</td>
</tr>
<tr>
<td>Ócsény-Oltovány (2370)</td>
<td>36.8</td>
<td>24.5</td>
<td>38.7</td>
<td>100.0</td>
</tr>
</tbody>
</table>

44 Becker 1994, 54.
45 Vörös 2000, 77.
46 Bokónyi 1974.
49 Gál 2010.
The natural environment of any site is of utmost importance. In the landscape surrounding Oltovány Castle, forested, scarcely habited areas were ideal for hunting; dry, hilly terraces were suitable for grazing caprines, while alluvial marshland habitats such as the immediate environment of Oltovány were favorable for pig keeping and grazing cattle.

By the late medieval period, species ratios changed at many sites in Hungary, indicating the increasing importance of pork in the diet, while mutton became less popular, and evidence of horse flesh consumption largely disappeared. This is in part due to typological differences between the settlements known from various medieval periods. Due to the increasing number of urban and high-status settlements, aside from the dominant role played by beef, pork consumption gained more emphasis. This is partly related to the settling of Western, predominantly German-speaking people invited to the territory of the Hungarian Kingdom after the devastating mid-thirteenth-century Mongol invasion. These settlers brought their own food habits that were adopted by the local population, whose meat diet originally included not only more mutton, but also the regular consumption of horses until the thirteenth century. The composition of animal remains from Őcsény-Oltovány is a good example of how these cultural changes became consolidated in the favorable natural environment of the Sió River floodplain prior to the sixteenth-century Ottoman-Turkish occupation, which again caused a decline in pork consumption.

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