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Quantitative and GIS-based archaeological analysis of the Late Roman rural settlement of Ács-Kovács-rétek

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Abstract

One of the biggest problems archaeologists face during interpretation is the fragmented and incomplete nature of the datasets often produced by field work. In most cases, the excavation of a whole site is not possible, and even the find material is so fragmented as to make their interpretation quite problematic. Such is the case of Ács-Kovács-rétek, a small Late Roman rural settlement, a part of which was excavated in 2009–2010. These excavations provided a very deep insight into the life of the village, but due to their limited scope, they still left a number of questions unanswered. For a more thorough interpretation of the site, we have to look at the find material and its spatial and chronological context from as many different angles as possible. Such analyses have to rely heavily on very detailed quantitative and GIS-based methods that can not only hold large amounts of very diverse information, but can also recombine this information for statistical and spatial analyses that can deepen our understanding of the site. The aim of this paper is to demonstrate the power of detailed quantitative databases and methods for site interpretation through the study of a Late Roman settlement, Ács-Kovács-rétek. During the course of this research a large number of attributes of the find material and the site itself were recorded in structured databases. Thanks to the rational structuring of this data, it could not only be statistically analyzed, but also compared to other sites as well, helping to solidify the timeframe in which the settlement was inhabited, and also uncovering several interesting patterns about its inhabitants. Furthermore, the combination of this data with spatial information even helped to recognize certain changes and spatial patterns within the settlement itself. By the end of my research, a clear picture emerged of this Late Roman village, showing a Romanized population living here from the end of the 3rd through the 4th century AD that not only had connections regionally, but also fit into a local rural landscape in the hinterlands of the Ripa Pannonica.

Introduction

The site of Ács-Kovács-rétek lies in the western part of Komárom-Esztergom County in the northwestern part of Hungary,[1] approximately 7 kilometers south of the Danube river, and 15 kilometers southwest of the town of Komárom, wherein lies the ruins of the significant Roman town of Brigetio. It was here in 2009–2010 where during rescue excavations archaeologists came across the remains of a Late Roman rural settlement, which is the subject of this article.

As can be seen from the geographic location of the site, it lies in a relatively prominent part of Pannonia, right next to not only the *Ripa Pannonica*, but a significant town (Brigetio) as well. Despite being in the hinterlands of both of the above, there is not much known of this rural area due to a lack of research available. This adds extra importance to the site, but also an obligation

1 The exact coordinates of the site are: 47°41’10.45"N, 17°58’13.56"E.

to examine it as completely as possible, and to place it in a regional context, so as to learn more about this economically and logistically crucial part of the region. The complete understanding of the site was only possible through GIS- and data-based quantitative methods, of which I aimed to use as much as possible during my study which was conducted as part of my MA thesis at the Institute of Archaeological Sciences of the Eötvös Loránd University, Budapest.

1. Topography and research history of Ács-Kovács-rétek

In order to be able to interpret the finds and the structure of this complex, it is important to put it in context first. This means that we have to take a look at the research history of its surroundings to better grasp the earlier research made in the area. Then, using this information (combined with available information about the natural circumstances of the area) we shall attempt to reconstruct the natural and anthropogenic setting of Ács-Kovács-rétek. Doing so will mean that any observation made during the analysis of this village can be put into a wider perspective, and thus will help in the final interpretation of the site.

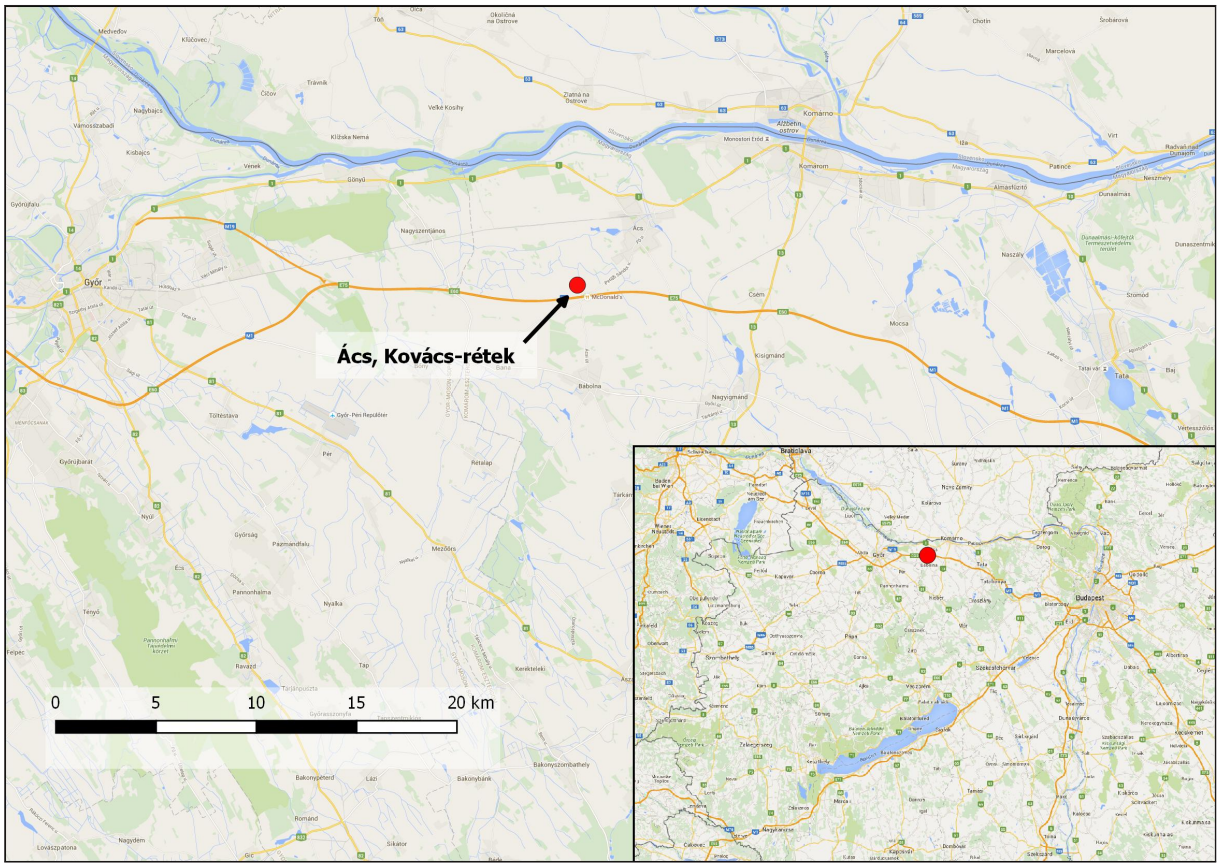


Fig. 1. The exact location of the site of Ács-Kovács-rétek.

1.1. Previous research in the vicinity of the site

The territory surrounding Ács was first mentioned in the archaeological literature by Flóris Rómer in 1863, when he wrote about ancient artifacts found in the vicinity of the village.[2] However, the first excavations in the area were only carried out in 1948 by László Barkóczi,

2 Rómer 1863, 44.

who successfully identified the remains of a roman fort at Ács-Vaspuszta.[3] From this point on there is relatively more information available, although most of it is unpublished, and can only be found in the archives. In 1952 there is a mention about carved stones found near the village, but their exact location is unknown.[4] In 1954, during the building of the village school, workers found several graves that belonged to the Roman era,[5] and in 1956 several carved stone pieces were found at Ács-Bumbumkút, which Lajos Dobroszláv dated to the 2nd century AD.[6]

1966 saw the beginning of further excavations at the fort of Ács-Vaspuszta, which continued until 1977.[7] Although these excavations provided a lot of information about the limes and the fortress itself, the hinterlands of the frontier remained largely unexplored: the first mention of this area only comes in 1969, when Éva Vadász and Gábor Vékony conducted field survey in the valley of the Concó stream. During this study they identified several sites dated to the Roman period, some of them in the vicinity of Ács, although their exact location is hard to identify.[8]

The next piece of information after this comes from 1990, when a military diploma dated to 206 AD turned up near Ács-Jegespuszta.[9] A possible Roman settlement was also identified in this area in 2004 by field survey.[10]

The most recent and detailed research near Ács began in 2009, when Máté Stibrányi conducted a field survey during the planning stage of a soon-to-be-built wind-power park.[11] During this work he recorded several new sites, some of them dated to the Roman age. In 2009 and 2010, in preparation for the constructions of the windmills, excavations were carried out at some of the sites identified by Máté Stibrányi, including Ács-Kovács-rétek. These excavations provided a large amount of new information about the area, although their evaluation is still a work in progress.

1.2. The Roman age landscape surrounding Ács-Kovács-rétek

Thanks to the research conducted in the last couple of years, we have a lot more information about the Roman age landscape surrounding Ács-Kovács-rétek, allowing us to see its general characteristics. According to the available data, the settlement is located in a typical rural landscape characterized by small settlements. However, the spatial density of these settlements shows a relatively dense population: at least three other settlements are known in the ten kilometer radius of the site, two of which lies within just five kilometers. While this can seem like a small number, we have to keep in mind that it is very likely that there are other, undiscovered settlements in the area, since no systematic field survey was ever conducted in this part of the region.

The settlement closest to our site is Ács-Jegespuszta, lying just four km to the southwest of Kovács-rétek, close to the finding spot of a military diploma in 1990.[12] In 2004 a small Roman

3 Gabler 1989, 7.
4 Archives of the Kuny Domokos County Museum, 24–73.
5 Archives of the Kuny Domokos County Museum, 23–73.
6 Archives of the Kuny Domokos County Museum, 25–73.
7 See Gabler 1989.
8 Archives of the Kuny Domokos County Museum, 122-73.
9 See Petényi 1997.
10 Archives of the Kuny Domokos County Museum, 268-2004.
11 See Virágos 2009.
12 See Petényi 1997.

age settlement was identified here by a field survey.[13] Not much else is known about the site however, since no more detailed research has been conducted here yet.

More is known about the site of Ács-Öbölkút, lying just four kilometers to the southeast of Kovács-rétek. In 2009–2010 an excavation similar in size to that on our site has been conducted there that revealed not only a settlement dated to the 4th–5th century, but part of a cemetery connected to it as well.[14] Some graves from the latter contained *fibulae* with bulbous knobsthat raise the possibility of the settlement's inhabitants having a certain degree of connection to the military or the provincial authorities.[15] This also represents some connection with Kovács-rétek, since it not only proves that both existed in the same timeframe, but the same kind of *fibulae* also found at Kovács-rétek could prove a similar populace as well.

Somewhat farther away than the previous examples, some ten kilometers away from Kovács-rétek lays the site of Nagyigmánd-Thaly-puszta. Archaeologists discovered traces of a Roman settlement here in 1971 during rescue excavations on the shores of the Szendi rivulet.[16] Sadly, not much is known about this settlement, since only a very small part of it could be examined. However, even its presence is a good indicator of the fact that this area was relatively well inhabited.

When we look at the aforementioned settlements closely, some patterns emerge, even though generally not much information is available about them. None of the available sources mention any trace of industrial activity at the sites. Given their natural environment (see below) it can be assumed that their main source of livelihood was agriculture. In addition it can be assumed from looking at some of the finds from the different sites that the inhabitants of the area had some kind of connection to the military or provincial authority. This, however, is not surprising, since all of the sites lay in the immediate hinterland of the *Ripa Pannonica*,[17] just a few kilometers from the fort of Ács-Vaspuszta,[18] which must have had at least some effect on the population.

In addition to the direct effect of the military this proximity to the limes and the Danube itself could be an influence: both the river and the military road running alongside it was an essential trade corridor connecting the region not only with other parts of the province, but also to the whole Empire. Evidence to this connection can be found even in the find-material of Ács-Kovács-rétek, which contained many pieces of pottery that was clearly imported from other parts of the province. Although the exact extent of its outside connections are still unknown at this time, these finds show that it was definitely part of a regional, or probably even wider economic network within Pannonia. This is probably true of the other settlements as well. However, since the main economic focus of the settlements was most probably agriculture it is essential to their interpretation to look at their connection to the natural environment in order to ascertain their agricultural capabilities.

13 Archives of the Kuny Domokos County Museum, 268-2004.
14 Fűköh 2011, 166.
15 Patek 1942, 73.
16 Vadász 1971, 35.
17 For more information on the Ripa Pannonica, see Visy 2000.
18 See Gabler 1989.

1.3. The natural environment of Ács-Kovács-rétek

Understanding the natural environment of a settlement is absolutely crucial to understanding many aspects of its choice of location and everyday life, as proven by several different studies conducted in different parts of the Empire. A good example of this is a study by Hector A. Orengo from 2010, concerning the Roman age topography of the region of Valencia, Spain.[19] During their study, he and his colleagues found that the location of villas in the area was directly influenced by the available soil types, but also by the regular floods of a local river. The location of these settlements show that the Roman age inhabitants of the area deliberately chose locations that were high enough not to be flooded, but close enough to the river as to be able to benefit from the soils fertilized by said flooding. It is not unreasonable to assume that the same kind of conscious choice of location was also present in Pannonia at the time.

The natural environment however may not only influence where the settlement was built, but its inner structure as well: a hillside village could look markedly different from a contemporary village in a more swampy area where more drainage is required. This means that by studying the general vicinity of a settlement we can already deduce some conclusions about it, which could also help to locate and interpret sites elsewhere.

The study of this factor is impossible without the proper use of GIS methods. These methods offer the possibility of using a number of different spatial and descriptive data types in the same framework, thereby helping discover connections between them that would otherwise remain hidden. It is also possible to use spatial data on different scales, which helps put locally collected data into a wider context. However, to gain meaningful results from the analysis we need data that is accurate and of good enough resolution to work on a local scale, and can answer the questions of the specific scenario at hand (of which no two are exactly alike). Therefore the choice of data to be used is a very important aspect of any GIS analysis, one that I had to keep in mind as well during my study of the site.

Given that the vicinity of Ács-Kovács-rétek is a mostly flat fluvial plain with very little variation in relief, the key part in its agricultural potential was soil quality and water availability. To analyze this in a local scale however, I needed relatively high resolution data, for which the obvious choice was the so-called DKTIR (Kreybig Digital Soil Information System)[20] developed by the Institute of Soil Sciences and Agricultural Chemistry of the Hungarian Academy of Sciences. This database contains a large variety of information about the soils of the region in question. However, for this research I only used the data on water balance, humus depth, and pH values. The data thus acquired shine an interesting light on the natural environment and agricultural potency in the region surrounding Ács-Kovács-rétek.

Surprisingly, the data shows that the site itself is located in a periodically flooded area, owing at least in part to a nearby stream. Evidence to this already came to light during the excavation: some parts of the site could not be fully excavated due to the large amount of ground water. It is also possible that the large number of ditches found in the settlement can also be attributed to this factor, and thus served as a means of drainage. Even so, it is clearly evident that the immediate area of the village is not especially well-suited for agricultural use. Looking at the

19 See Orengo et al. 2010.
20 See Pásztor et al. 2010; 2012.

wider surroundings of Ács-Kovács-rétek, however, we can see that this kind of environment was not the most wide-spread in the area. While there are narrow, meandering areas that are at least periodically flooded, most of the soils in the area have high aquiferousity and good water-bearing ability, and mostly have a neutral or alkalescent pH value. These soils are generally well suited for agricultural use, and the large number of streams in the area (accompanied by a high level of ground water) would mean that water availability should not have been a problem. Therefore these attributes combined provide relatively good conditions for agriculture. However, there are some areas in the close vicinity of the site that stand out. One of these is a 27 hectare region just 300 meters to the northwest of the settlement, which is situated on a very slight hilltop surrounded by periodically flooded areas. Its soils have very high aquiferousity and a neutral pH, and although their water-bearing ability is somewhat low, the average humus depth in this area is 10 cm deeper compared to the average of 50 cm measured in the general area. This (combined with the other attributes) means that the area is exceptionally well-suited for agriculture, which could potentially mean it had a priority in cultivation even in the Roman age, thus having influence over the land-choice of nearby inhabitants.

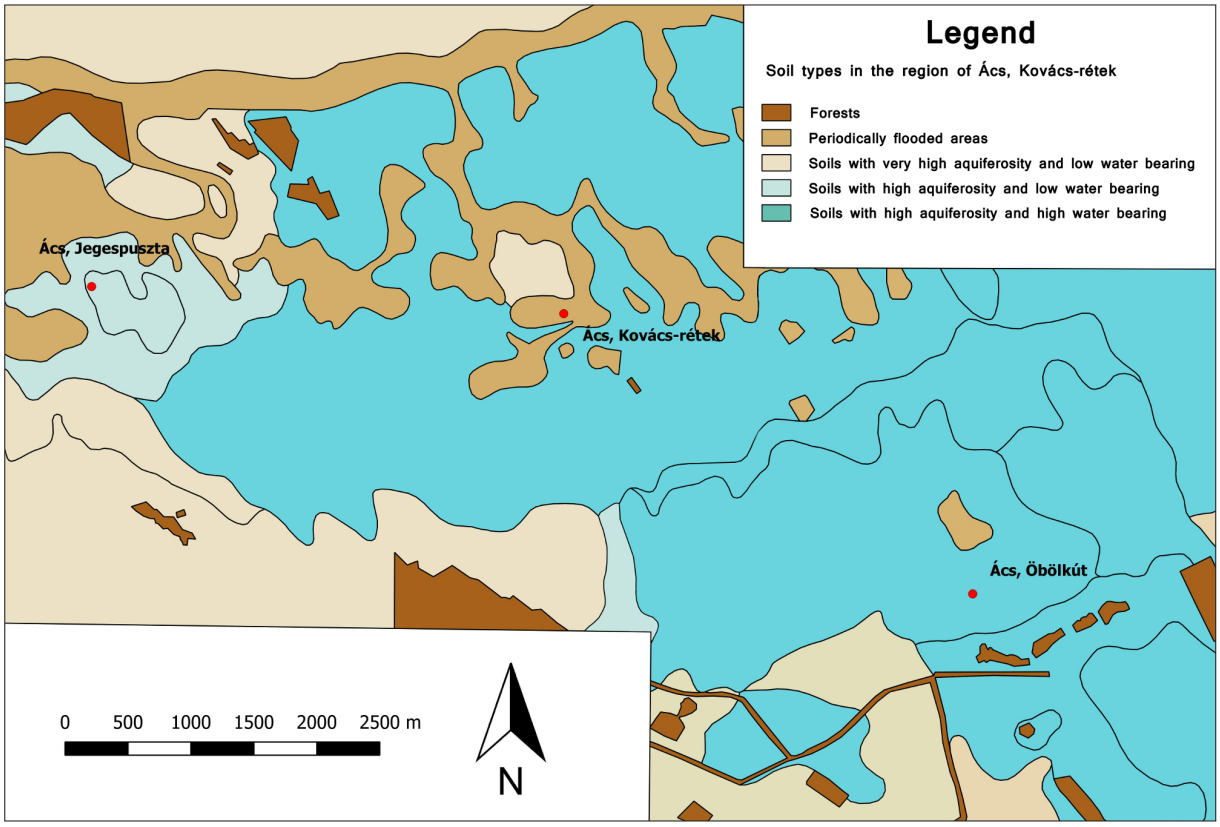


Fig. 2. Soil types in the region of Ács-Kovács-rétek.

If we summarize the above information we can see a clear trend developing in this site's location. The village itself lay on land that was comparably ill-suited for agriculture, but rich in easily accessible water, which is very important for everyday life of a settlement. However, the immediate catchment of the village was rich in very potent soils in a radius close enough for economically feasible cultivation. This area (according to Vincent Gaffney and Zoran Stančič) has been determined as 5 km.[21] These trends affirm the supposition that the choice of location

21 Gaffney – Stančič 1991, 36–37.

for the settlement of Ács-Kovács-rétek was a very calculated process, in which natural factors definitely played a role. The question is: can we deduce the same at the other sites in its vicinity, or is this an isolated phenomenon?

If we look at the site of Ács-Jegespuszta, a slightly different picture emerges. Although there are some temporarily flooded areas in its vicinity, the settlement itself is not located on one of them. Instead, it is located on soils with high lime content, high aquaferousity and water-bearing ability, and a neutral to alkalescent pH, meaning relatively good soils. It cannot be said however, that the agricultural potential of this area was excellent: humus depth is only 20 cm, which is 30 cm shallower than the average in the region. Looking at the wider surroundings though, we can see several areas with good soil conditions all around the site, which were most probably prime candidates for agricultural cultivation.

In the case of Ács-Ördölkút the conditions are similar to Jegespuszta in many ways. According to the soil quality maps the site lies not on a temporarily flooded area, but on a region with lightly alkalescent pH, good aquaferousity and water-bearing ability. During the 2009 excavations at the site, however, researchers discovered remains of former watercourses. In addition to this, the average humus level was quite fluctuant, which together with the aforementioned riverbeds show that the area was very rich in water,[22] and thereby convenient for a settlement. Looking at the wider area around the settlement though, we can see some interesting trends. If we look at the whole catchment of the settlement, it has a much lower humus depth than the surroundings of the other sites, paired with fairly average soil attributes. This makes this area less potent for agricultural use than the catchment of the other sites studied here. However, a more detailed analysis of the catchment shows smaller pockets of slightly better soils that are mostly concentrated around the site of Ács-Ördölkút, which could have been a driving factor for settlement. Therefore even though the settlement is in one of the less potent areas in the wider region, it still holds one of the agriculturally better spots inside its wider area.

In conclusion we can see some interesting trends emerge in the locations of the settlements in the region surrounding Ács-Kovács-rétek. On the one hand we can see a preference for areas more suited for agricultural use: we can see this in any of the three sites available for study. In a more local context however, we can see that the settlements themselves are mostly not located on these potent soils, but some distance away from them, in agriculturally less favorable, yet water-rich areas. Although only one of the sites (Ács-Ördölkút) has a confirmed watercourse next to it,[23] the other two were located in a setting that had relatively high groundwater levels, where accessing water through wells was convenient enough to provide good conditions for the settlement.

This duality of influences strongly suggests that the settlements involved in this study were mostly agriculturally focused. This fact is further affirmed by the lack of evidence of industry at any of them. It also shows that their location was the result of a deliberate choice, and not just some coincidence. It has to be said though, that during this study I only looked at natural properties governing settlement choice. It is almost certain that social elements (administrative borders, military presence, etc.) and economic factors (roads) also had an effect

22 Fűköh 2011, 166.

23 In the case of Ács-Kovács-rétek a large ditch running across the village (Feature no. 11) has been excavated, but according to the stratigraphic context it was determined that it was not present in the active phase of the settlement, but dug later. Thus it was discarded as a water source for this analysis.

on settlement choice, but since data about these is scarce in this region I could not factor these into my analysis. It also has to be mentioned that although we only know three Roman age settlements in this area, this does not mean that there weren't any more. Our knowledge on the topography of this region is still incomplete, and thus needs more research before we can be sure that the patterns we see in settlement location are genuine, and not just the result of us not knowing any of the sites that would not fit into them. It would also be advantageous to compare our findings with settlements from other parts of the province (or even the whole Empire), to see if the same conclusions apply there, or if the patterns we see here are influenced by some local phenomenon. Sadly, this is beyond the scope of my current research. Still, thanks to this look at the natural surroundings of Ács-Kovács-rétek we have a much clearer view of the environment it was situated in, and what could have motivated its former inhabitants to settle here. These findings also bring up new questions, however: did the natural environment have any visible effect on the inner structure of the village itself? If so, how did this manifest? For us to be able to examine this, we have to take a closer look at the site, and the features excavated in it.

2. The inner structure of the settlement at Ács-Kovács-rétek

2.1. GIS methods applied to the study of the settlement structure

During the excavations a total of 112 features dating to the Roman age were discovered at the site. These paint a picture of a settlement that is characteristic of the native population, lacking any stone buildings, consisting only of pit houses and wooden surface structures. Beside the houses a large number of pits and trenches were discovered, encompassing the whole settlement area in a complicated system. In order to understand this system we have to analyze the direct and indirect connections between the features not only spatially, but in regards to the finds as well, thus creating a large web of data on the connections between many aspects of the features. By studying this data network it becomes possible to recreate the settlement's structure layer by layer and document the changes within it. The complexity of such an analysis however requires an effectively structured GIS database that can incorporate both spatial and descriptive information together.

Creation of such a database was a key component of my study from the start. Doing so allowed me to store every bit of site information in one interconnected system, opening up a host of new options to analyze not only the descriptive or quantitative aspects of the features, but their spatial characteristics as well, both locally and (thanks to the projection system inherent in a GIS system) even regionally. Its structure also made it possible to compare these characteristics to those recorded at other sites by simplifying descriptive data conversion and enabling the information of different sites to be handled in the same framework on any necessary scale. However, this need for connectivity brought with it a number of problems and solutions with it during both the planning and implementation phases. These problems are not unique to my system, but are general issues that have to always be kept in mind when building GIS systems with outside compatibility in mind, and therefore are worth expanding on in detail.

The first task of the development process was to convert the already existing data into formats suitable to the needs of a GIS system. Luckily, spatial information about the excavation was available in vector graphic format, although only as an AutoCAD DWG file. While this format is

very effective for vector drawings and representation, it lacks the ability to connect descriptive information to the graphical representation of the features. Also, DWG files only use a local coordinate system instead of a global projection system that is an essential component of a GIS database. These drawbacks of the file format meant that the data needed to be converted into a different format. After carefully weighing the options, it was decided that the ESRI SHAPE (.shp) format would be best suited for my research. Aside from fulfilling all the basic requirements for a GIS database it had a very important advantage over other formats (mainly MapInfo TAB): it is compatible with almost any available GIS software, including QGIS, which was used extensively during my research. The only downside of the format is that it can only utilize one kind of vector geometry (point, polyline of polygon) per database. This however could be circumvented by thematically distributing the different data types into several different databases. These can then be used in the same framework, thanks to their unified projection system, for which the EOV projection[24] was chosen, it being the most widespread system in Hungary. EOV is also meter-based, so the conversion from the DWG (which was drawn with the correct EOV coordinates in its local system) did not need any additional georeferencing.

The conversion from DWG to SHAPE resulted in several separate vector datasets containing polylines and points only, the latter being the geodesic reference points recorded during the excavation. The polylines depicted either the edges of features, or their interior details. As the database development progressed, the former (represented by closed polylines) were converted into polygons, each symbolizing one stratigraphic unit of the site, accompanied by one line in the attribute table of the database. In some cases more than one polygon makes up a stratigraphic unit (for example trenches excavated in several small segments). In these cases the polygons in question are grouped together, and are represented by one line in the attribute table. When one unit is inside another one (like in the case of postholes within buildings) the polygons representing them were placed atop one another. This presented some issues with drawing order (some features could not be selected on the map due to them being under larger objects), but these drawbacks were compensated by the relative ease of spatial measuring compared to the alternative (cutting holes into the polygons).

After the conversion and processing of the spatial information, the next step was the creation and formatting of the descriptive data that would be connected to the resulting polygons. This was a crucial element of the database development. In order to be able to analyze the data correctly I needed a structure that is clear-cut and searchable. Therefore I needed to separate the data into many small, concise categories that could be pliantly recombined, while also attempting to use quantified data in as many cases as possible. The end result was an extensive table of information that can essentially be divided into two main categories:

- Information related to the identification of the feature: this was based on the documentation of the excavation, and contains data regarding the identification and general description of the features (ID numbers, feature type, etc.).
- Finds connected to the feature: the data in this group concerns the finds that have been found in the different stratigraphic units. Of the whole find spectrum, only the pottery and animal bone remains were used in the database, because other find types were too

24 EOV is short for „Egységes Országos Vetület", EPSG: 23700.

few in number for an effective spatial analysis. Scattered coin finds have been put into a different database based on their recorded coordinates, each represented by a point. The finds themselves have been structured as quantitative data: for every type of find a number of categories have been defined as columns of the attribute table, and the number of finds from the feature belonging to that category has been added to these as records. In the case of pottery the categories have been based on the categories defined in the separate, quantitative pottery database used for their sorting. In the case of the animal bones only the species they belonged to were used. This type of data handling made it possible to study the spatial distribution of features by the amount of finds of different types that have been found in them *(Fig. 3)*.

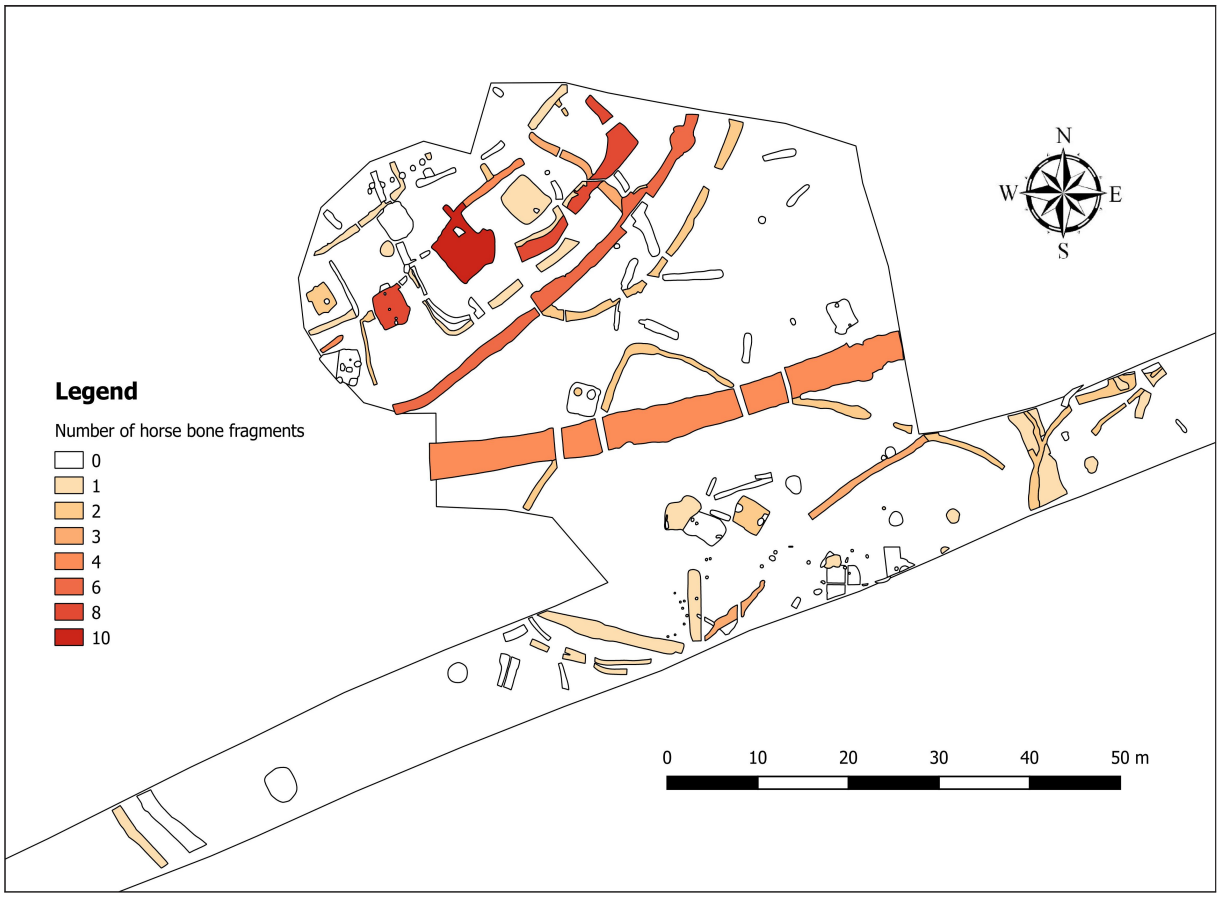


Fig. 3. Example of the visualizations made possible by the GIS database.

The resulting database, due to its quantitative nature provided us with a very well searchable and filterable data structure. This meant that a number of analyses could be carried out to find trends in both the attribute data and the spatial information connected to it. And since the database utilizes projection systems, these trends can be compared to not only other sites, but to other types of spatial information as well (elevation models, soil maps, etc.), broadening the perspectives of site interpretation. With its help, it was much easier to discover and visualize the connection between features, and to paint as accurate a picture of the site in regards to its structure and its changes over time as possible.

2.2. Interpreting the features of Ács-Kovács-rétek

The 112 features dating to the Roman age that have been excavated at the site form a complex settlement structure that suggests that several rebuilding periods took place in the village. While features from other eras were also found at the site, these do not mix with the Roman settlement that spans most of the extent of the excavated area. Still, only parts of the whole settlement could be excavated, with an unknown amount of it remaining underground. While this fact hampers our ability to analyze the whole village together, even from this portion of it some relatively detailed conclusions can be drawn about the life and structure of the site in the Roman Age.

The site shows the picture of a typical rural settlement, mainly consisting of pit houses, interwoven by trenches and pits of various shapes and sizes, without any sign of stone buildings. Settlements of similar character are known to have existed even before the Roman Age: a good example of this is the Iron Age site of Sajópetri.[25] This sort of settlement then survived through the Roman occupation, mostly at the settlement sites of the native population, featuring pit houses dominantly even in the Late Roman Age. Trenches are also a dominant feature of these sites, creating a complex mesh around and between buildings, serving not only as boundaries, but as drainage ditches as well. A good example of such a complex is visible at the 2nd–3rd century phase of the indigenous settlement of Győr-Ménfőcsanak,[26] the structure of which shows many similarities to the site of Ács-Kovács-rétek.

It is important to note, however, that even though the settlement structure demonstrated by Ács-Kovács-rétek is mostly characteristic of the native population, the use of pit houses themselves is not confined to indigenous settlements. Evidence, such as the settlements excavated at the site of Páty-Malomdűlő[27] and Budaörs-Kamaraerdő-dűlő[28] shows that they were in wide-spread use even in provincial, romanized settlements. It can also be seen at these sites that pit houses were used in every period of the settlement's existence, many times next to and in correlation with stone buildings. Examination of the map of Budaörs-Kamaraerdő-dűlő also reveals quite extensive areas that only contain pit houses,[29] even though the site itself was rich in stone buildings. Considering that in the case of Ács-Kovács-rétek only one part of the whole village was excavated, this means that we also cannot rule out the presence of masonry here entirely, even though so far no evidence has been found to support it.

The aforementioned evidence also suggests that even though the settlement itself was lacking any signs of urbanization, its inhabitants could have been romanized. This fact is also corroborated by the artifacts found at the site. Among these a number of sherds belonging to *mortaria* have been identified, a type of vessel mostly attributed to provincial lifestyle.[30] Similarly, the building style of the buildings also suggests a Romanized population: even though only pit houses were found, many of them contained *tegulae* or *imbrices* in their filling, meaning that many of them could have had tiled roofs. This building custom is not typical of the indigenous people, and is mostly attributed to the Romans.

25 Szabó 2007, 201–227.
26 See Tankó – Egry 2009
27 Ottományi 2007, 140–205
28 Ottományi 2012, 103–104.
29 Ottományi 2012, 148–149.
30 Bónis 1991, 123.

Other than the roofing however, the pit houses themselves don't give many clues about their occupants or function. Their structure mostly aligns with the standard forms that are present from the Late Iron Age through the Roman Age. The form of these buildings changes very little over time, although this variation makes it possible to typify them, most recently attempted by T. Budai Balogh.[31] He bases his typology of these buildings on their size, and the number and arrangement of their posts, which could hint at the structure of their roofing. Altogether he defined three main building types, each having several subtypes. However, his analysis does not account for buildings that have an irregular shape. A number of such buildings have been found even at Ács-Kovács-rétek, and in other settlements too. They are very hard to reconstruct, since they don't fit into any standard categories, and instead require each and every one to be reconstructed individually.[32]

Among those buildings that fit into regular categories the most frequent are the ones with oblong square shape, with two posts holding the roof, each near the middle of the shorter side inside the pit. This type can be observed frequently not only in Celtic settlements like Sajópetri-Hosszú-dűlő,[33] but also in provincial villages, even in the Late Roman Age.[34] Variants of this type also include houses with the same shape, but with a different number of posts. In some cases, identification of these posts (and thus the reconstruction of the roofing) is quite problematic, as they can lay outside the pit, where their exact connection with the building can be questionable.[35] Sometimes their remains are hard to identify even inside the buildings: such is the case of Feature No. 103 in Ács-Kovács-rétek, where the only sign of roof-bearing posts were two small nooks in the shorter wall of the pit *(Fig. 4.1)*.

Similarly to other villages, the largest number of houses in Ács-Kovács-rétek also belonged to Budai Balogh's Typ II.C. A total of five such buildings were discovered: features No. 53, 70, 88, 95 and the aforementioned No. 103. Their size varies between 6.7–17 m^2, while their shape is mostly rectangular, with a certain degree of irregularity and roundedness at the corners evident in all of them. All but two of them had only two posts holding the roof up: in the case of No. 88 and 95 however, several other posts were discovered by the longer side of the house. Furthermore, house No. 88 had a large rectangular-shaped extension at its northwestern edge. Though stratigraphic evidence suggests that it was coexistent with the building, no postholes were to be found in this extension, thus it is uncertain if it had any roof over it, or even its function or connection to the house itself. A similar problem exists in the case of house No. 83: here a small shoulder could be found in the side of the pit, likewise without any postholes, or any evidence to point out its exact function within the building. Questions such as these however show just how problematic the interpretation of pit houses can be.

Aside from these houses a further three more have been excavated where although evidence of posts have been found, the shape of the pit and the arrangement of the posts are different from the aforementioned type. The best example among these is feature No. 98: this partially excavated, rectangular-shaped building had postholes at the mid-point of all three of its known

31 Budai 2009, 86–100.
32 Tímár 2009, 100.
33 Szabó 2007, Fig. 20.
34 Budai 2009, Typ II.C, 91–93.
35 Budai 2009, 86.

sides. Sadly the fourth side of the building lay beyond the boundaries of the excavation, thus we have no information about a fourth posthole that may or may not have existed there. It is also worth mentioning, that evidence of a fireplace has been found in the northwest corner of this house, which although in regional context is not particularly unique,[36] in the case of Ács-Kovács-rétek this is the only house where such a feature has been found.

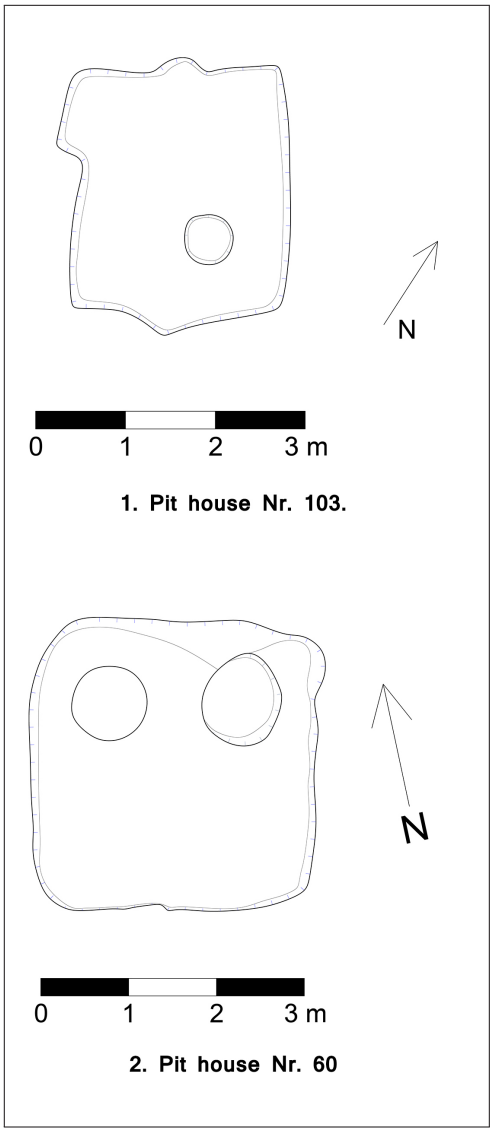


Fig. 4. Pit houses from the site of Ács-Kovács-rétek. No. 103 (1) has two probable postholes represented by nooks in the pit wall, while No. 60 (2.) has no observable postholes.

As we can see even though evidence to the posts holding the roof has been found in many of the houses, their interpretation and reconstruction is still questionable. Even more problematic are the houses where no such features have been found and only the pit itself remained. In the case of Ács-Kovács-rétek a total of three buildings belong to this category: features No. 60 *(Fig. 4.2)*, 83 and 93. Reconstruction of the structure of these houses is still very problematic, even though a number of them have been found at provincial settlements like Budaörs-Kamaraerdő-dűlő[37]

36 Budai 2009, 97.
37 Ottományi 2012, Fig. 89, B1.

or Ménfőcsanak.[38] In both of these cases a structural wall has been theorized as to be holding the roof without the help of posts, although the exact reconstruction of such a structure is still questionable. A similar reconstruction has been hypothesized for a house in Sajópetri-Hosszú-dűlő, the structural wall being a wattle-and-daub construction supported by small posts.[39] This is unlikely to have existed in Ács-Kovács-rétek though, since the posts would have needed at least some smaller postholes, none of which have been found here. It is possible, however, that their remains were simply too shallow to be recoverable, and thus were missed during the excavation. It is also possible that the structural wall consisted of logs or bricks, as hinted at by ethnographic analogies.[40] These kind of walls would need no postholes or foundation to be built, although the use of bricks as building material can probably be precluded as no evidence of bricks (apart from *tegulae*) have been found at the site. The use of logs as building materials also have no evidence currently to support it. The interpretation and reconstruction of pit houses without postholes therefore still remains questionable.

Another very important, but still very problematic question pertaining to pit houses is their function. As their standardized structure suggests, their forming is mostly functional. No attributes are presently known that would differentiate a building used for industry from one used for living[41] aside from some specific finds, of which not much has been found in Ács-Kovács-rétek. The only notable example comes from house No. 93 in the shape of a spindle-whirl, hinting at a possible industrial use for the building. It is worth noting however, that several functions could have overlapped, one house being used for both living and industry. Therefore even if some evidence of industrial use comes to light from a certain building, some degree of a living function cannot be ruled out, or *vice versa*.

As we can see from the aforementioned sections, many questions still remain about the houses excavated at Ács-Kovács-rétek. Despite this, there are certain trends that do tell us something about the settlement and its inhabitants. Even though there is a certain degree of variance in the structure of the excavated houses, all of them belong to the same category, predominantly attributed to the indigenous Celtic population. There is no sign at all of pit houses with large number of posts along their longer sides, a building type mainly linked to barbarian immigrants of the Late Roman Age by T. Budai Balogh.[42] This hints at a population mainly consisting of Romanized local elements.

In light of this however, it is interesting to note that surface buildings supported by posts are also missing at the site, even though they are quite common in provincial settlements dating from the 2nd century AD onwards.[43] Though postholes arranged in a line have come to light both in the northern (Feature No. 92) and southwestern (Feature No. 19) part of the site, these cannot be reconstructed exactly as buildings, since in both cases only one line of postholes have been found. It has to be noted however, that Feature No. 92, a linear structure consisting of seven postholes, runs almost parallel to the boundary of the excavation, therefore it is possible

38 Tankó – Egry 2009, Fig. 7.
39 Szabó 2007, Fig. 7.
40 Tímár 2009, 95.
41 Budai 2009, 77–81.
42 Budai 2009, 101, Typ II.F.
43 Budai 2009, 82. For examples of other such buildings see Gabler – Ottományi 1990.

that other parts of the structure (that could possibly identify it as a surface building) could still be underground. Until further study however, this possibility cannot be verified. The same is the case with Feature No. 19.

Another interesting feature is a large cluster of postholes (18 in total) scattered around the southern part of the site.[44] Their presence suggests some sort of surface structure. Their scattered location however does not allow any conclusions to be drawn as to what this structure might have been, or even if they belonged to only one structure. Together with all other buildings (both pit houses and surface structures) they still remain questionable, and in need of further study.

Aside from buildings, a variety of other features have also been found at the site, of which 37 are pits of various shapes and sizes. Their most likely uses have been for storage or garbage disposal, although it is impossible to pinpoint any of them to only one of these uses. They mostly contained only a very small amount of finds (both in respect to pottery and animal bones), with the one exception being Feature No. 40. While the average number of pottery sherds found in pits throughout the site was only 4.19 with animal bones at 2.63, pit No. 40 contained a total of 93 sherds and 34 animal bones. This makes it highly likely that this particular pit can be identified as a garbage pit. Such identification is not possible at any of the other pits.

Compared to the number of pits, fireplaces were even less plentiful: only two features could be identified as such. One of them was Feature No. 79, located in the northwestern corner of house No. 98, the only such feature at the site that is connected to a building. The only other known fireplace is feature No. 35, an open fireplace. Not much else is known about this feature, since its condition made any kind of reconstruction impossible.

By far the most numerous of features were the trenches encompassing the whole site. Every one of these had a U-shaped cross-section, and although their walls were mostly steep, not one of them had an even V-shape. They probably had dual uses, with water drainage and border-marking both being likely and very hard to get apart. In many cases the bearing of a trench could indicate a border function. A good example of this is trench No. 59, which starts out running in a southeastern direction, with a perpendicular change roughly in the middle, thus encompassing an area that contains (amongst others) several buildings, the orientation of which match almost perfectly with the trench. This, similarly to trench No. 108 and 112 makes it very likely that at least part of its function was to delineate the border of a household, or some other spatial structure. Identification of such spatial features in the settlement is very important, especially since no clear roadways have been found that could indicate the interior organization of the village. The complex stratigraphic nature of the trenches in Ács-Kovács-rétek however makes identification of any household units very problematic, and thus only a partial picture can be drawn of it in this regard as of yet.

Even more problematic is the identification of a water drainage function for the trenches. A possible indicator of such could possibly be the gradient and direction of their declination. After careful analysis of this data (in comparison with a surface model built from geodetic points of the excavation) however, no clear structure could be observed. There were some features that had a consistent direction of declination throughout their length, but in most cases

44 Some of them belong to Feature No. 85, some do not have a Feature ID number.

this coincided with the natural declination of the surface relief. No trench that had a different direction of declination than the surface relief (which would be a sure sign of deliberate drainage planning) has been found. Also, no uniformity in declination directions among trenches could be detected anywhere in the site, therefore even if the trenches had a drainage purpose, they did not drain the water to one certain area. This however does not mean that the trenches did not serve water drainage purposes to at least some degree, especially since the site was located in a periodically flooded area. It is very likely instead, that these trenches had dual purposes, which cannot be exactly separated from each other.

As it can be seen from the aforementioned section, many questions still remain about the features excavated in Ács-Kovács-rétek both individually, and as an interconnected structure that built up the settlement together. Their frequent overlaps make it hard to recognize any complete structure for the settlement, but also prove that the village had undergone changes at least once in its lifetime. Therefore it is essential for the reconstruction of the settlement to separate these periods from each other. This however is not possible by looking at the features alone: as the above shows their structure is too general for that. The only way to do so is to analyze the artifacts that have been found in them that can tell us more about not only the chronology of the site, but the inhabitants as well.

3. Analysis of the find material of Ács-Kovács-rétek

A total of 1002 artefacts have been unearthed during the excavations of Ács-Kovács-rétek, their nature very diverse: aside from the most numerous pottery sherds and animal bone fragments, a number of glass, metal and bone items have come to light. These items tell a lot about the everyday lives of the inhabitants, as well as helping us determine the timeframe in which the settlement was occupied, and the changes that occurred during this time.

3.1. Pottery

By far the largest in number from the artefacts are pottery fragments: a total of 857 pieces belong to this group. They came to light scattered all across the settlement, meaning their careful analysis both in respect to the finds themselves and their spatial situation was paramount to understanding the nature and temporal breakdown of the settlement.

One of the biggest problems that arose during the analysis was the fragmented nature of this find group. Most of the pieces that came to light were only small fragments of vessels. Furthermore, most of these pieces contained only the body of the vessel (a total of 470 pieces, 54.8% of the whole pottery spectrum), which tell us only a limited amount of information about the whole shape of the vessel. Meanwhile, vessel rims account for only 21.8% (187 pieces), and bases for 20.3% (174 pieces) of the total assemblage. Due to these percentages, only a handful of vessels (133 pieces, 15.5% of the whole collection) could be adequately classified according to their shape, while the rest could only be partially identified.

The aforementioned problems made it very important to analyze the available assemblage not only in a qualitative way, but from as many aspects as possible in order to maximize the information gained from them. To be able to achieve this, I needed a sorting system that helps to capture as much quantitative data as possible, and enables the creation of a well-structured

database. The best solution for this was the adaptation of the sorting system employed during the analysis of both the excavation of Mount Beuvray,[45] and the previously mentioned Sajópetri-Hosszú-dűlő.[46] The basis of this method is that every aspect of every sherd is classified according to a predefined set of classes that cover every aspect of their physical and descriptive character. Every class has a codename, and thus in the end every single sherd can be characterized with a simple, easy-to-decrypt code sequence, every code segment describing different aspects of their character. This data can then be handled easily in a tabular format, one that then can be well filtered and easy to search. Also, by reconfiguring this tabular data it is relatively easy to gain detailed quantitative data about different aspects of the site's find material.

For the sake of this sorting system, the pottery assemblage of Ács-Kovács-rétek has been sorted into six main categories:

1. quality (by the crudeness of tempering materiel)
2. color of the vessel's fabric
3. production method (wheeled, hand-made, etc.)
4. vessel type (pot, dish, etc.)
5. sherd type (body, lip, etc.)
6. decoration type

To make searching in the database easier, decoration modes have been divided into two subcategories:

- applied decoration: every type of decoration that involves the application of any material (paint, etc.) to the surface of the vessel
- incised decoration: every type of decoration not involving the application of any material on the surface of the vessel, instead involving the modification of the raw surface

At the end of the sorting process, the above mentioned method resulted in a well-structured tabular database that was easy to filter and quantify. This made it possible not only to analyze trends and correlations within the pottery assemblage statistically, but the well-structured dataset was also applicable to GIS databases, enabling the observation of spatial correlations within the find material as well.

3.1.1. Conclusions about the pottery assemblage as a whole

The structured database allows us to analyze not only individual vessels, but the composition of whole subgroups, or even the whole pottery assemblage of Ács-Kovács-rétek as well. By studying this data, certain trends become visible that tell us a lot about the inhabitants of the settlement.

One of these trends is the large percentage of coarse wares in the assemblage: 712 sherds (83% of the whole material) belonged to this relatively poor quality category. The question

45 Szabó 2007, 229–234.
46 See Szabó – Tankó 2007.

is: does this mean that the inhabitants of the village were relatively poor compared to other settlements, or does this percentage fit into larger regional trends? To answer this, we need to compare our data to other similar sites in Pannonia. However, since most publications do not contain such exact numbers, the number of sites I could compare to was relatively small. In respect to civilian sites, it was limited to Tokod-Erzsébet-akna,[47] Budaörs-Kamaraerdő-dűlő,[48] Szakály-Rétiföldek,[49] and the road station of Fertőrákos-Golgota.[50]

Given however, that some of the artefacts, and the proximity of the Danube suggests at least some degree of connection to the military at Ács-Kovács-rétek, it was deemed necessary to not only analyze other civilian settlements, but assemblages with military connections as well. Therefore the military camps of Ács-Vaspuszta,[51] the military town of Carnuntum,[52] and the pottery workshop next to the watchtower of Leányfalu[53] were also included in the study, lending a much broader spectrum of data.

These analyses yielded some interesting results, especially when we look at military-related sites. The percentage of coarse wares observed at Leányfalu was much lower than those at our site, with only roughly half of the total pottery assemblage.[54] Similar ratios could be seen at Ács-Vaspuszta as well: here, out of the 572 sherds of published Late Roman pottery, only 295 pieces (51.6%) were classified as coarse wares.[55] These, however are all sites that are closely related to the military, therefore the evident difference in pottery quality from Ács-Kovács-rétek brings up a very important question: is this difference only an evidence of the relative poverty of Ács-Kovács-rétek, or is this a common difference between military- and civilian settlements?

The answer to these questions lies within the analysis of other civilian settlements in Pannonia. The results of these analyses draw a starkly different picture. In the case of Tokod-Erzsébet-akna, coarse wares took up 92.87% of the total pottery assemblage.[56] Similar numbers can be observed at the Late Roman period of Szakály-Rétiföldek as well.[57] Furthermore, looking at other settlements proves that these trends are by far not confined to Eastern Pannonia: while in Carnuntum the percentage of imported wares in the pottery assemblage was 21.13%, [58] such vessels in Fertőrákos-Golgota only took up 4.4%.[59] Of course the latter number be directly converted into ratios of coarse wares (since there are a number of locally made types of fine wares), the trend is very similar, the number of high-quality vessels being considerably lower in rural settlements than in settlements with military ties closer to the Danube.

These trends, while statistically in need of further refinement and more data, still show that there is at least some degree of connection between the wealth and the profile of Late Roman

47 See Mócsy 1981.
48 See Ottományi 2012.
49 See Gabler – Ottományi 1990.
50 See Gabler 1973.
51 See Gabler 1989.
52 See Grünewald 1979; 1986; Gassner 1990.
53 See Ottományi 1991.
54 Ottományi 1991, 7.
55 Gabler 1989, 577.
56 Mócsi 1981, 84.
57 Gabler – Ottományi 1990, 174.
58 Gabler 1996, 160.
59 Gabler 1973, 168.

settlements, with military-based populations generally using more high-quality pottery than populations of civilian nature. It is likely however, that these trends cannot be explained by the different social and monetary stance of these populations alone. A very important factor that also has to be considered is the effect of the Danube, one of the most important trade routes between Pannonia and the rest of the Empire, and thus the most important source of imported wares in the province.[60] Influence of such a trade route could explain the spatial difference between the composition of assemblages from different settlements, but with the military focus being on the Danube as well, it is hard to distinguish their influence from the effects of the Danube. For starker conclusions to be possible, some further, more detailed research is still required.

Even though the aforementioned questions regarding the influence of certain factors in the artefact assemblage of settlements remain, the analyses still help us to draw some conclusions about Ács-Kovács-rétek. While it is located clearly in the hinterlands of the *Ripa Pannonica*, the ratios of the artefacts found at the site point towards more of a civilian population, resembling the characteristics mainly attributed to settlements further away from the border, with only a relatively smaller number of fine wares observable, and almost no imported wares at all (except for a few sherds of Samian Wares). Still, even though they only take up a small percentage of the pottery material, this subgroup contains a relatively large variety of vessel types, showing that the settlement's inhabitants had more than a few connections to the provincial economy. In order to understand the extent and characteristics of such a network, however, we need to look at each of the different vessel types found at the site. Such an analysis could not only show how wide the ties of the settlement are, but could also provide a large amount of information about its inhabitants, and the timeframe in which they occupied this area.

3.1.2. Analysis of the fine wares found at Ács-Kovács-rétek

3.1.2.1. Imitations of Pompeian Red Wares

During the excavations of Ács-Kovács-rétek a very small amount of sherds (three in total, 0.35% of all pottery and 2.07% of the fine wares) have been found that can be identified as imitations of Pompeian Red Wares. It is probable that these sherds belonged to only two different vessels, which were found in pit No. 40 in the southwestern part of the site.

Both of these vessels belong to one well-defined type of pottery, found at a number of different sites in Pannonia. Generally, these wares are all identified as bowls with a yellow fabric, and a strong, shiny red slip applied to the interior surface only. Their origin can be traced back to Italia,[61] from where they were exported to other parts of the Empire in large quantities. While their production in Italia is likely to have ceased around the end of the 1st century AD,[62] their local production might have continued even until the 3rd or 4th century AD,[63] including some workshops in Pannonia. It is very likely that the sherds found at Ács-Kovács-rétek belong to these locally made types as well, although their exact place of origin is still unclear, since the making of such vessels was very generalized throughout the Empire, showing little to no

60 Gabler 1996, 161.
61 Schoppa 1961, 58.
62 Gabler 1989, 476.
63 Gabler 1977, 163.

variety.[64] Through the analysis of the composition of the interior slip,[65] however, it can be confirmed that production of such vessels did take place in Pannonia, a fact already theorized[66] earlier based on the finds at several pannonian sites. According to these finds, sherds of this type were most prominent in Pannonia in the 2nd century AD, although their production in several places (such as Brigetio[67]) could have lasted until the end of the 3rd century AD.[68]

The characteristics of the Pompeian Red Ware imitations found in Ács-Kovács-rétek conform to those found in many other places around Pannonia. Their fabric is of good quality, and yellow of color. Their rims are straight, or slightly inverted. The red slip completely covers the interior, while the exterior remains bare, except for a small portion of it just below the rim of the vessel. In one case a small, horizontally incised line is added at the edge of the painted area on the exterior *(Fig. 5.1)*, while the interior has no decoration except for the slip. Their analogues have been found both in Brigetio[69] and Ács-Vaspuszta.[70] This implies the possibility that they were made in a local workshop, possibly in Brigetio, although without further evidence this designation still remains questionable.

All of the sherds belonging to this type have been found in one pit in the southwestern part of the site, relatively far from the settlement's core. Their exact dating is questionable at this time, although stratigraphic evidence suggests that they were buried no earlier than the Severan period, making these some of the earliest finds of the site. The fact that they exist here shows that the settlement's population was Romanized to some degree even in its earlier stages.

3.1.2.2. Terra Sigillata

Similarly to the Pompeian Red Wares, *terra sigillatae* came to light in very small numbers at the site: only three sherds were found, all of them relatively small in size and in bad condition.[71] Also similarly to the Pompeian Red Wares, all of them came from the same area in the southwestern part of the site. Both their small size and their worn-out quality make their exact identification difficult, and indicate that they were used for a relatively long time before being buried, making their exact dating problematic.

The oldest of the sherds originates from La Graufesenque, and was probably made at the end of the 1st or the beginning of the 2nd century AD *(Fig 5.2)*. Its exact vessel type is unidentifiable due to its size. Though its exterior contains some decorations in the form of two horizontal lines with floral ornamentation in between, the prevalence of this decoration type on vessels from this workshop prohibits the identification of the vessel even through possible analogues.[72]

The second identifiable sherd found at the site is considerably younger, fitting better into the probable timeframe of the settlement. It originates from a workshop in Schwabmünchen, and was probably made in the Severan period, belonging possibly to a Drag. 37 type bowl *(Fig. 5.3)*.

64 Peacock 1977, 176.
65 Gunneweg et al. 2004, 33.
66 Gabler 1977, 163.
67 Gabler 1989, 476.
68 Pásztókay-Szeőke 2001, 15, note 46.
69 Fényes 19998, 45–46.
70 Gabler 1989, 476.
71 The identification of the Samian Ware sherds was carried out by Dénes Gabler, for which I'm very grateful.
72 Mees 1995, Taf. 43.1.

Its decoration contains an ovolo motif, with an unidentified figure in a relief-field underneath, separated from the ovolo by a zigzag line. Its analogues have been found at a number of places, including Brigetio,[73] where a similar sherd (decorated by the figure of a boar) has been found, similarly originating from the same workshop.

Aside from the aforementioned *terra sigillata* pieces, only one other has been found at the site. However, its bad condition and lack of decoration prevented any kind of identification. This worn-out condition exemplifies the problematic nature of these vessels, although it also shows that the vessels in question were used for a long time, making it probable that even the oldest of them was only buried somewhere around the Severan period, a fact corroborated by other finds from the same features as well. Still, the presence of Samian wares further underlines the probable Romanized nature of the settlement's inhabitants[74] even in the early stages of its habitation.

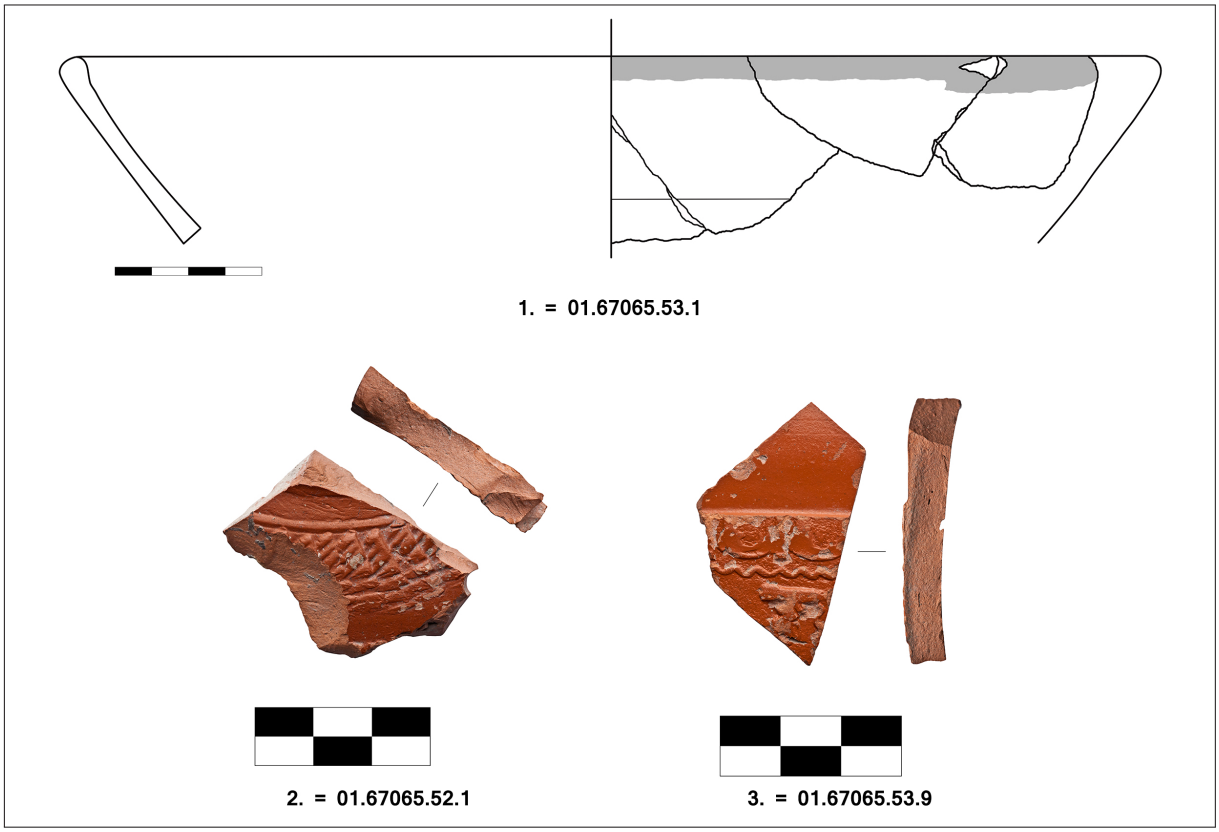


Fig. 5. Pompeian Red Ware Imitation (1) and Samian wares (2–3) from Ács-Kovács-rétek.

3.1.2.3. Vessels with color coated horizontal bands from Brigetio

Although more numerous than the previous types, vessels from Brigetio with color coated horizontal bands were still only found in a small quantity, with only 5 sherds known from the site. All of them came from a single feature, ditch No. 47, but due to their fragmented condition it is impossible to tell how many vessels they belonged to originally. Their matt-red coated decoration however, helps to characterize them as vessels belonging to a specific type that is very characteristic, but not unique to this area.

73 Gabler 1985, Abb. 1.1.
74 For more information on Samian wares, see Gabler 2006.

This matt-red coating, mostly found on the top third of the vessel (with other parts of the vessel left bare), and often complemented by "dotting-wheel" or incised linear decoration, is very characteristic of this vessel type.[75] The fabric of the vessel is always of high quality and has a yellow color. Origins of such vessels can be traced back to Celtic pottery.[76] After the Roman conquest of Pannonia, their use has spread throughout the province, with workshops known in Poetovio,[77] Aquincum[78] and in the vicinity of Lake Fertő[79] from as early as the 1st–2nd century AD. It is probable that the making of such vessels spread from these workshops to Brigetio,[80] where in the 3rd century their production became the most prominent in the province.[81]

The most typical vessel forms belonging to this type are handle-less jugs with outcurving rims, horizontal-rimmed pots, round-bodied vessels, wide-rimmed jugs with one handle.[82] In some cases even round-bodied jugs with three handles[83] have been found to belong to this type. Most of them are thought to have been made in military workshops,[84] with production traceable through the entirety of the 3rd century.[85] A sharp decline in the number of finds, however suggests that their production is likely to have stopped around the end of the century.

According to this information it is very likely that the vessels of this type found at Ács-Kovács-rétek can be dated to a period between the end of the 2nd and the end of the 3rd centuries AD. Due to their fragmentation, however, their exact analogues, or even the form of the vessels they belonged to cannot be identified. Their presence, however tells us that the settlement was definitely active during the 3rd century AD, and had at least some degree of economic connections within the region, possibly with the town of Brigetio, where such vessels were made in abundance.

3.1.2.4 Pannonian grey slip ware (Pannonische Glanztonware)

Among the fine wares found in Ács-Kovács-rétek, Pannonian grey slip wares represent the largest group: a total of 31 sherds belong to this category, which accounts for 24.8% of the fine ware assemblage. The type itself is generally characterized by a light grey colored fabric of very good quality, with a shiny, grey colored slip covering both the exterior and the interior of the vessel.

The majority of identifiable sherds found at the site belong to dishes, with one exception being a pouring vessel with steep walls. In most cases the pieces did not contain any decoration beside the slip. The stamped decoration so often attributed to this type of pottery is also nowhere to be found here. This makes their exact identification and the finding of analogues very hard, since most typologies and publications about these vessels concentrate on the stamped decoration

75 Bónis 1970, 71.
76 Póczy 1958, 64; Bónis 1969, 167.
77 Bónis 1970, 80.
78 Póczy 1956, 94.
79 Gabler 1973, 158.
80 See Bónis 1975.
81 Bónis 1970, 78.
82 Bónis 1970, 74–75.
83 Póczy 1958, 66.
84 Bónis 1970, 82.
85 Gabler 1973, 158; Gabler 1996, 153.

for classification.[86] Therefore vessels without stamped decoration are relatively rare in the published material.[87]

Pannonian grey slip wares (as their name suggest) are a distinctively Pannonia product, with little to no occurrence outside the province.[88] Within Pannonia, however, their presence is wide-spread, with evidence of production observed in numerous places, including Aquincum,[89] and the so-called "Gerhát pottery workshop" in Brigetio.[90]

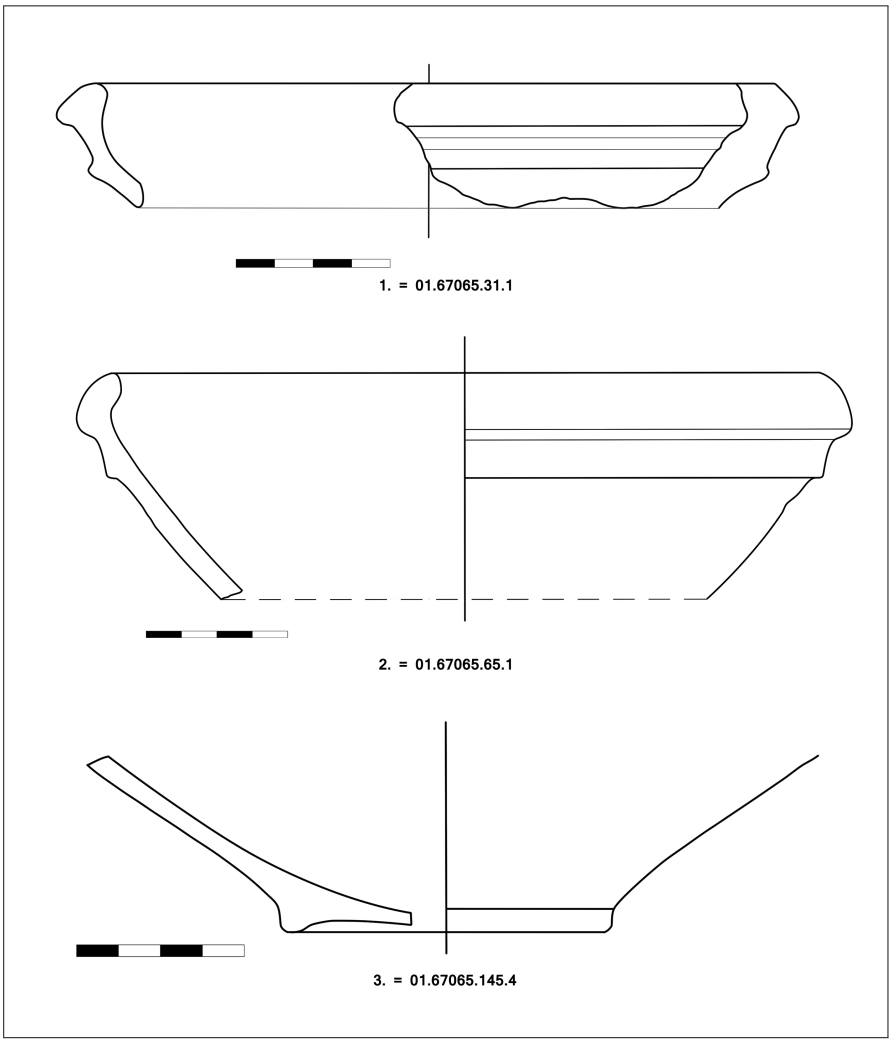


Fig. 6. Pannonian Grey Slip dishes.

Several different typologies exist of these vessels, the most accepted of which is the one made by Dénes Gabler in 1975, based on the regional occurrence of the different subgroups within this vessel type.[91] Looking at the find material however, it is evident that there is a lot of overlap between the different groups, which could either mean that several types were quite standard across the province, or that these vessels were subjects of an active intra-provincial trade network.

86 Maróti 1987, 81–82; Bánki 1989.
87 Petznek 2004, 45.
88 Adler-Wölfl 2004, 90.
89 Nagy 1928, 98–99.
90 See Bónis 1979.
91 Gabler 1975, 153.

As to the dating of Pannonian grey slip wares, they first appear at the end of the 1st century AD, and flourish in the 2nd century AD. Their production probably continues well into the 3rd century AD,[92] up until the beginning of the 4th century AD, when they disappear from the provincial find material.[93] This timeframe falls precisely into the lifetime of the settlement of Ács-Kovács-rétek. In order to date the sherds found at the site more precisely, we need to look at their analogues from other sites.

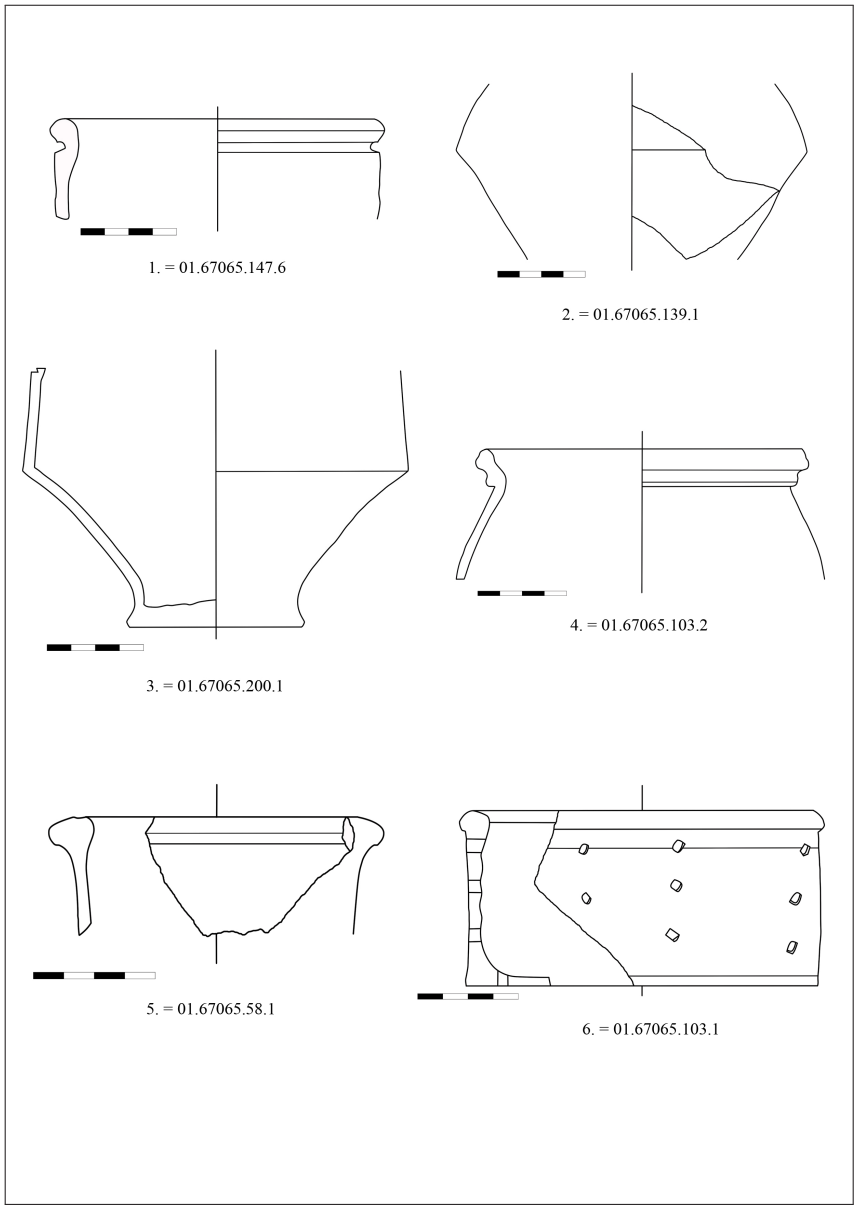


Fig. 7. Pannonian Grey Slip ware dishes (1–5) and a pouring vessel (6).

The majority of the find material consists of dishes, which are very varied both in shape and size *(Fig. 6.1–3, 7.1–5)*. In respect to their form, we can see a variety of rim shapes, with both outcurving and inverted rims. Their decoration mostly consists of ribbed or grooved decorations. Vessels with angular walls and biconic vessels are also present in the assemblage.

92 Petznek 2004, 45.
93 Maróti 1987, 81.

Analogues of these bowls are quite numerous, with similar vessels surfacing in Carnuntum,[94] Brigetio,[95] Salla,[96] Budaörs[97] and Aquincum.[98] The wide-ranging spatial distribution of these sites shows clearly how popular these vessels were throughout the province.

While the dishes found in the assemblage are quite common, there were two sherds at the site that are less ordinary, both belonging to pouring vessels *(Fig. 7.6)*. They both belonged to different vessels, but had a similar shape: their walls were very steep, with a flat base. Both their walls and base were pierced by rectangular holes in a regular pattern. No exact analogue to them is known as of yet, although a similar, but partly different vessel is known from Budaörs-Kamaraerdő-dűlő.[99] A similar vessel is also known from Tokod,[100] although that one was a coarse ware with no slip for decoration, and worse quality overall. The exact origin of the sherds found in Ács-Kovács-rétek is therefore not yet known, similarly to their dating, which is also true to all the Pannonian grey slip wares found at the site. Most of their analogues listed above point to the 3rd century AD,[101] although their worn-out condition could suggest that they may have been used for a long time before buried. This aligns well with some of these sherds that have been found in a definitely Late Roman setting.

As we can see from the analysis of Pannonian grey slip wares at the site many questions still remain unanswered about them. However, their strong presence at the site suggests (along with Pompeian red ware imitations and vessels with color coated horizontal bands from Brigetio) that even in a relatively early stage in the late 3rd century AD the settlement was not only active, but was using a variety of provincial wares. This variety points toward it being part of at least a local trade network, possibly with Brigetio at its center.

3.1.2.5. Glazed pottery

As their analyses point out, the aforementioned pottery types all belonged to the earlier stages of the settlement, proving an early Romanization for its inhabitants. Glazed wares are different in this regard, as they belong squarely in the Late Roman period, and thus the later period of the settlement. A total of 15 such sherds have been found at the site, taking up 1.75% of the total, and 12% of the fine ware assemblage. Put into contrast, these numbers fall considerably behind those of other sites from the period, where the ratio of glazed pottery in the total assemblage usually comes between 4–10%.[102]

Similarly to other ceramic types found at the site, glazed pottery sherds were quite fragmented. Despite this, all but four of them could be categorized according to their form, six of them being parts of *mortaria*, four of them jugs, and the remaining one belonging to a small cup.

All of the sherds found at the site definitely belong to Late Roman vessels, even though the glazed decoration technique has already appeared in Pannonia in a limited fashion in the 1st

94 Petznek 2004, 48, Abb. 11; Adler-Wölfl 2004, Fig. 3.47, 7.142–143; Grünewald 1979, Taf. 18.4, 19.4, 20.3.
95 Maróti 1997, Fig. I.4, III, XI.1.
96 Maróti 1987, Fig. 8, 10.5.
97 Ottományi 2012, Fig. 170.7, 171.4.
98 Maróti 1991, Fig. I.26.
99 Ottományi 2012, Fig. 171.9.
100 Mócsy 1981, Taf. 10.7.
101 Petznek 2004, 48.
102 Ottományi 1991, 20.

and 2nd centuries AD,[103] when a number of different workshops are known to have produced glazed wares.[104] At the beginning of the 3rd century AD glazed wares disappeared almost completely from the provincial find material,[105] with production restarting only at the end of the 3rd century AD. Vessels produced from then on, however are completely different from their Early Roman counterparts, with a complete lack of relief decoration, and a different color spectrum and glaze quality. The colors of the glaze became much more varied, with various shades of yellow, brown and green becoming the most frequent. It has also been observed that the prevalence of the different colors differ from workshop to workshop, providing an opportunity in some cases to determine the origin of these vessels.[106]

Beside the glaze itself, there is also a change in the form of the vessels and their distribution between grave finds and settlements: while the earlier is mainly dominated by cups and mugs, the latter mainly consist of tableware (dishes, jars).[107] The appearance of glazed *mortaria* can also be attributed to this period,[108] with other notable forms being dishes with horizontal rims, cups with handles, and bell-mouthed jugs.

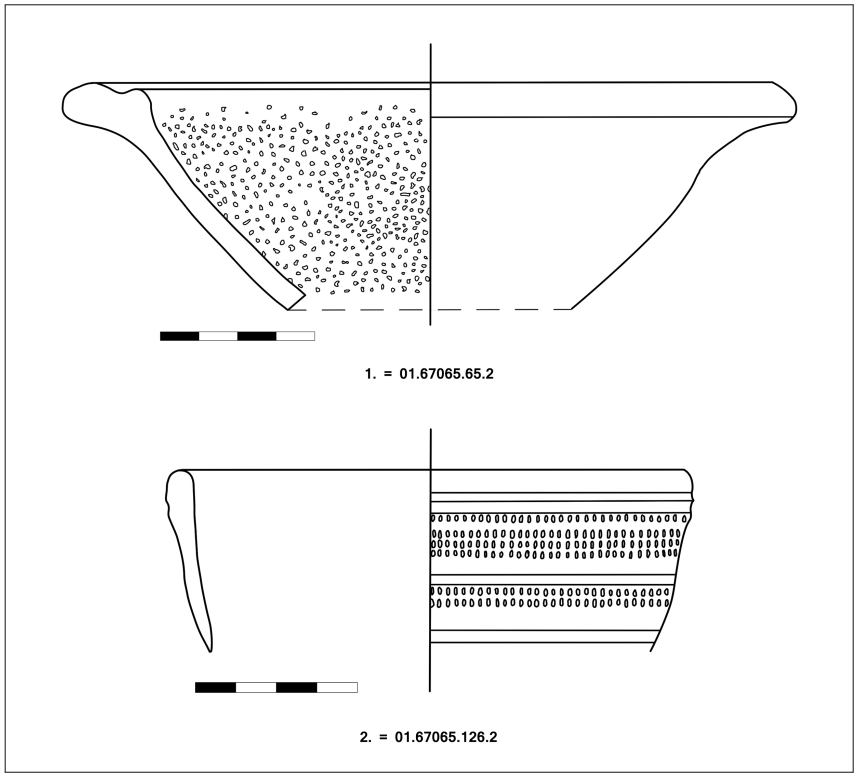


Fig. 8. Glazed *mortarium* (1) and cup (2) from the site.

The glazed pottery assemblage of Ács-Kovács-rétek fits well into the characteristic settlement assemblages mentioned above, with distinctively Late Roman attributes. Some of the most important pieces among these are those belonging to *mortaria*, the presence of which is thought

103 Gassner 1991, 44–45; Kocztur 1976.
104 Bónis 1990, 24; Barkóczi 1992, 8.
105 Gassner 1991, 51.
106 Ottományi 2011, 273.
107 Bánky 1992, 36.
108 Bónis 1991, 123–129.

to be a clear evidence of a Romanized population.[109] Although *mortaria* are present in the Pannonian find materiel from the Early Roman period, no such wares were made with glazed decoration before the Late Roman period. The first appearance of such vessels is dated to the end of the 3rd century AD,[110] with their mass spreading at the beginning of the 4th century AD.[111] Their production and use can be traced until the beginning of the 5th century AD.

The dating of such vessels in Pannonia being so relatively concise, it is more than probable that the glazed *mortaria* sherds found at Ács-Kovács-réteg can also be dated to the 4th century AD. Their attributes are generally in line with the standard forms found throughout the province. Their fabric is either grey or yellow of color, which shows an interesting connection with their decoration: while the vessels with grey fabric were always coated with a green glaze, those with yellow fabric were coated with a yellow or brown one. Their rims contain the wide collar and the high cordon at the rim that is characteristic of these vessels, while the body is generally steep, the glaze covering only the interior of the vessels *(Fig. 8.1).* Their analogues can be found in a number of workshops, such as Leányfalu,[112] Pilismarót-Malompatak[113] and Tokod.[114] A number of similar vessels have also been observed in Budaörs-Kamaraerdőd-dűlő,[115] Ács-Vaspuszta[116] and Carnuntum.[117]

Beside the *mortaria*, a number of other wares have also been found at the site that have a glazed decoration, although only in smaller numbers. An outstanding one among these is a small, well identifiable sherd that probably belonged to a small cup, one which had a light brown glazing, with multiple rows of rouletted decoration between rows of cordon just below its straight rim *(Fig. 8.2).* Analogues of this sherd are known not only from Ács-Vaspuszta,[118] but from Tác[119] as well. Both of these vessels have been dated to the first half of the 4th century AD, therefore it is highly likely that the piece known from Ács-Kovács-rétek comes from this period as well. Other known glazed ceramics from the site include four sherds that probably belonged to a jug, although due to their fragmentation an exact reconstruction is not possible.

In conclusion, although glazed ceramics came from the site in relatively small numbers, they provided very important information about the settlement. Their presence shows that the site was most certainly occupied in the first half of the 4th century, and possibly even in the second half as well. It also shows that the Romanized population that has been characterized by earlier fine wares is still present, using vessels that are distinctively Roman well into the 4th century AD, with their ties to a regional trading network still present.

3.1.2.6. Further fine wares found at Ács-Kovács-rétek

The aforementioned high quality pottery types all have one thing in common: due to their distinctive decorations, all of them can be identified as relatively distinct pottery types. As can

109 Bónis 1991, 123.
110 Grünewald 1979, Taf. 63.
111 Ottományi 2011, 266.
112 Ottományi 1991, Fig. 13–14.
113 Bónis 1991, 126.
114 Bónis 1991, Abb. 2.
115 Ottományi 2011, Fig. 206, 4–5.
116 Gabler 1989, Fig. 117, 45–51.
117 Grünewald 1986, Abb. 6.3
118 Gabler 1989, Fig. 118, 56, 56/a.
119 Fitz et al. 1975, 302, Fig. VIII.5–9.

be seen from the previous chapters, these vessels give us a lot of very important information about the outside connections and the dating of the settlement.

A number of other sherds, however, could not be identified so well: while their quality and decoration most certainly sets them apart from coarse wares and characterizes them as fine wares, their decoration and form is too generic to identify them as part of any specific and well traceable vessel type. A total of 74 such pieces have been found at the site, of which 58 had some sort of coating on its surface, while another 16 had burnished decorations. The color of the vessels and the decoration separates the earlier group into two further categories, one being the vessels with grey fabric and coating, and the other with yellow fabric and red coating. Both of these have relatively different characteristics, which demand them to be discussed separately.

Vessels with grey coating

Out of the 58 pottery sherds decorated by a colored coating, 33 were of grey fabric and coating. Their fabric of very high overall quality, showing that these vessels were indeed fairly high quality ones, although they are mostly decorated only with a coating, which is complemented with an incised linear or ribbed decoration in only two cases. The form of the vessels also show their representative status, with only one pot in the assemblage, the rest consisting of 13 sherds belonging to dishes, and 2 belonging to pouring vessels *(Fig. 9.1–3)*.

Dishes, the most numerous of the forms in this category form a relatively standardized group, with most of the vessels having inverted rims and a continuous, steep-angled body. Their analogues can be found both in Leányfalu[120] and Ács-Vaspuszta.[121] There are even some similarities to certain coarse wares to be found, which points towards their use as tableware, albeit certainly high quality ones. Their relatively generic character however, does not lend any clues as to their origin or exact place in the chronology of the site.

Besides the dishes, a small number of fragments from pouring vessels were also found. Both of these had holes cut through their body that were similar to the ones observed on certain Pannonian grey slip wares. Identification of the original form was only possible for one of the sherds, with analogues for it found amongst coarse ware in Tokod.[122] This trend of grey-coated ceramics having very similar forms to coarse wares points towards the probability of them having very similar origins and uses, with grey-coated ones being simply better quality and more luxurious versions of coarse table wares. This however also means that their forms are relatively standardized, and thus they don't give much information about their exact origin or dating.

Vessels with red coating

A total of 20 ceramic sherds in the assemblage of Ács-Kovács-rétek are known to have red coating as a decoration. Similarly to grey-coated vessels, most of these had good quality fabrics, although they are yellow of color, and the presence of additional decoration types is more frequent amongst them than with the grey ones: in six cases this includes incised linear decorations, while in one case there were traces of polishing on the surface of the sherd. Both their decoration and their good quality suggests that they were relatively prestigious in nature,

120 Ottományi 1991, Fig. 1.6.
121 Gabler 1989, Fig. 114, 14/b.
122 Mócsy 1981, Abb. 10.9.

although similarly to the grey-coated wares their common forms and fragmentation made most of them unidentifiable.

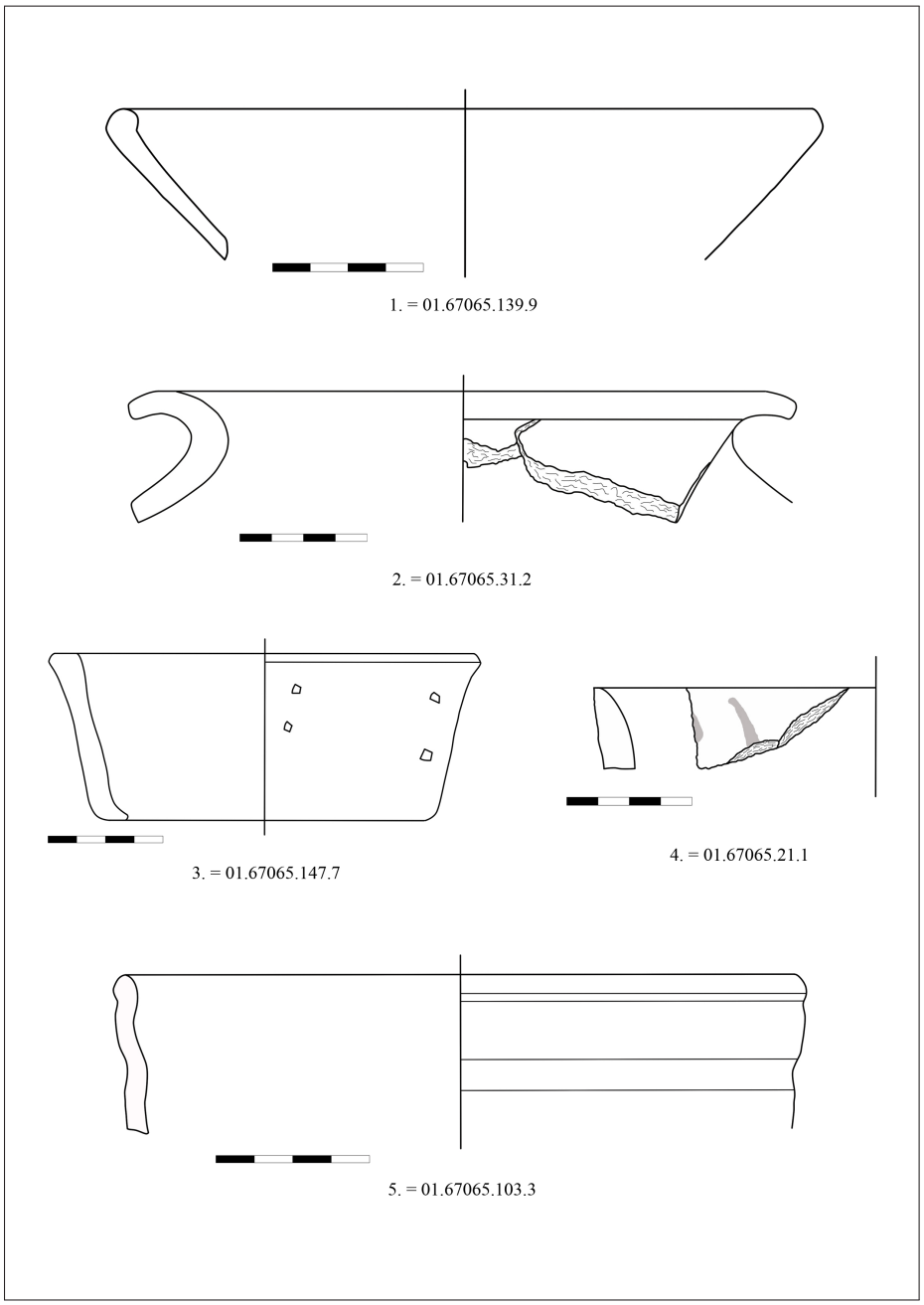


Fig. 9. Vessels with grey (1–3) and red coating (4–5).

The most numerous of the forms were the dishes in this group *(Fig. 9.4)*, although due to their fragmentation this identification was mostly only possible by examining the angle of their walls. There was only one fragment that could be identified relatively well: a vessel with very steep walls and a wavy rim that was very similar to a vessel from Szakály *(Fig. 9.5)*.[123] A fragment with parts of a footring was also found, although with the rest of the vessel fragmented beyond identification, no analogues could be found.

123 Gabler 1996, 17, Fig. 4.

Only two other sherds from the red-coated assemblage could be identified, both of them belonging to jugs. One of them was a neck-fragment, while the other came from the lower part of a vessel. Only the latter could be identified relatively well, with its analogue known from Szakály,[124] although the whole of the body could still not be reconstructed, only the lower part of the vessel.

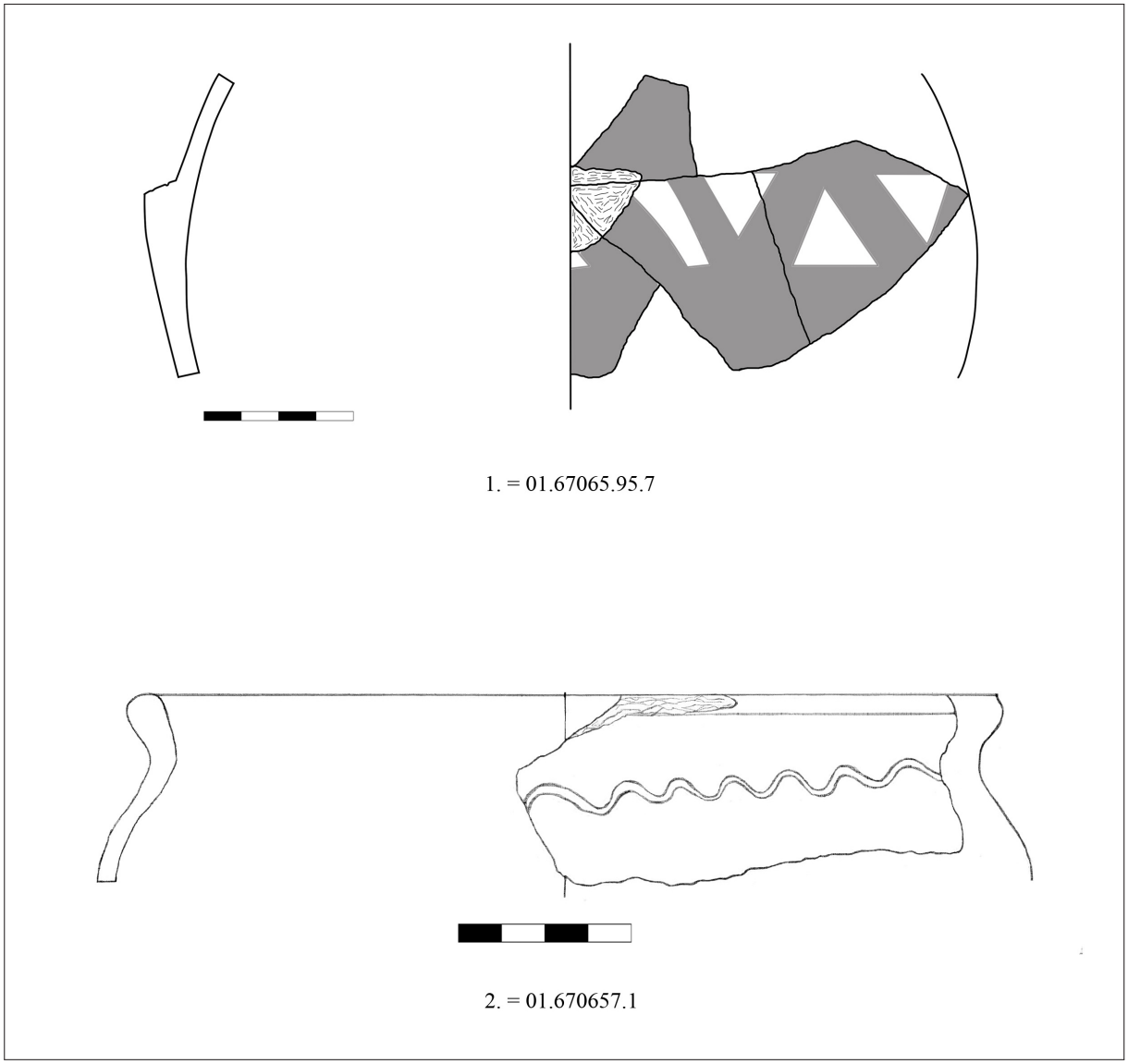


Fig. 10. Unique red coated vessel (1) and pot with burnished decoration (2) from Ács-Kovács-rétek.

No other fragments could be identified from the assemblage of red-coated vessels, although there is one interesting fragment that still bears mentioning. Though the form of the vessel it belonged to cannot be identified (only that it had a globular body with yellow fabric), its decoration makes it unique. This decoration consists of a matt red coating that is similar to the one observed on vessels with red coated horizontal bands from Brigetio. This coating however does not cover the exterior of the fragment completely, as it has several evenly spaced triangular-shaped areas that are left bare *(Fig. 10.1)*. Such a decoration is not only unique in the pottery assemblage

124 Gabler 1996, Fig. 13, 11.

of Ács-Kovács-rétek, but in the whole province as well, with no exact analogues to be found. Although painted triangular decorations are known from several late Celtic sites,[125] in all these cases the triangle is the one painted on the surface, and not the other way around. Therefore these cannot be named as exact analogues, although the geometric decoration does suggest some degree of relationship between them. This is further emphasized by the connection of the sherd to vessels with red coated horizontal bands from Brigetio through the color and characteristics of the coating, and by the fact that they were found in the same stratigraphic unit. Therefore it is not impossible that this is a unique product made by one of the potteries making such vessels, although without any analogues such connection cannot be proven yet.

3.1.2.7. Burnished vessels

A total of 16 sherds in the pottery assemblage had burnished decoration. Most of them were of good quality, although there were some lower quality pieces that were closer to coarse wares than the aforementioned pottery types.

The decoration style itself, while quite frequent in Late Roman pottery assemblages, traces back its origins to the Late Iron Age.[126] It has also been used in the Early Roman period up until the Marcomannic Wars.[127] After that, the production of such vessels suddenly ceases, with the decoration style being mostly absent from the find material until the '30s of the 4th century AD.[128] From that point on, however, burnished wares became very frequent at Late Roman settlements. It is very likely that the burnished pottery found at Ács-Kovács-rétek also belonged to this period, which is affirmed by the fact that they were found in the same stratigraphic units as the glazed *mortaria* that have also been attributed to the later phase of the settlement.

As to the different patterns of burnishing on the Late Roman vessels, most of them come in the form of wavy, horizontal or vertical lines, but cross-hatching is also a common pattern.[129] In the case of the vessels in Ács-Kovács-rétek, however, only wavy and vertical lines can be observed in the assemblage.

Due to the fragmentation of the material, exact forms cannot be identified in most cases, except for one sherd that was probably part of a pot with outcurving rim and widened shoulder, decorated by burnishing in the shape of a wavy line on the shoulder *(Fig. 10.2)*. This pot is very similar to some of the coarse wares found at the site, and has a wide range of analogues: similar vessels have been found in Budaörs,[130] Pilismarót-Malompatak[131] and Ács-Vaspuszta.[132]

There were no other well-identifiable burnished pottery sherds in the assemblage of Ács-Kovács-rétek, given their usually fragmented nature. Their presence however (together with the glazed *mortaria*) clearly shows that the settlement was indeed active during at least the first half of the 4th century AD. The fact however, that their ratio in the pottery assemblage is much

125 Ottományi 2012, Fig. 176, 1–3.
126 Bónis 1969, 176–177.
127 Ottományi 2012, 200–204.
128 Ottományi 1996, 113.
129 Ottományi 1996, 105–111.
130 Ottományi 2012, Fig. 159.13.
131 Ottományi 1996, Abb. 6.1.
132 Gabler 1989, Fig. 125.25.

smaller than in other Late Roman settlements probably hints at the village being relatively low-key in the second half of the century, a fact also underlined by other finds as well.

3.1.2.8. Summary of fine wares of Ács-Kovács-rétek

In summary, by looking at the fine wares of the site, a large amount of information could be collected not only about its timeframe, but the nature of its inhabitants as well. A number of different types found at the site show that the former inhabitants were most probably leading a Romanized lifestyle (owing to the glazed *mortaria*), and were using a number of distinctly provincial vessels even in the early phase of the settlement. This early period most probably fell somewhere around the end of the 3nd century AD. According to the potteries, the use of provincial-type vessels did not end there, but continued well into the 4th century AD, through the later stages of the settlement as well.

Aside from the chronological questions it answered, the pottery assemblage of the site also shows us that to at least some degree the settlement of Ács-Kovács-rétek had at least regional economic connections, possibly with Brigetio as a hub. This assumption is attested by the relatively large number of pottery types and analogues that were probably made in the potteries of Brigetio.

We have to keep in mind, though, that fine wares only take up a small percentage of the total pottery assemblage of the site, the rest being coarse wares. While these are much less identifiable as individual types, they are the everyday vessels used by the inhabitants, and therefore could tell a lot about the everyday life of the settlement. Also, since no evidence of pottery production has been found at the site, it is probable that they were all made elsewhere, therefore by mapping their possible analogues, we can expand our knowledge of the economic network of the site.

3.1.3. Analysis of the coarse wares found at Ács-Kovács-rétek

Although quite a number of different fine wares have been found at the site, they are by far in the minority of the total pottery assemblage, 83% of which (a total of 712 pieces) is taken up by coarse wares. While the function of the fine wares is probably mostly representational (which is emphasized by their small numbers, high quality and decoration), the coarse wares are the vessels of everyday use, either for cooking, storage, or as tableware. Given their different use than that of the high quality vessels, their study could reveal trends within the settlement from a different angle.

A number of different characteristics of the material however make these analyses still quite problematic. One of these issues is the fragmented nature of the vessels. This problem was present with the fine wares as well, where in many cases the small sherds made it hard to identify exact vessel types. Still, 41.5% of the pieces could be characterized according to their general vessel type, although in many cases this was still not enough for complete classification. In the case of the coarse wares however, this percentage is significantly lower, with only 14% of the sherds. One of the main reasons behind this is the high fragmentation of the material, probably attributable to their lower quality and higher porosity. This fragmentation made lots of features that are essential for complete characterization unreadable, and therefore even the type of vessel the sherd belonged to was unidentifiable.

A further issue that hindered the analysis of coarse wares stems from their function. Since they were everyday objects, their form and design was influenced much more by functionality than in the case of fine wares. This leaves much less room for variation in their features, leading to generally the same forms being used often for centuries throughout the province. Therefore even if we can identify which part of a vessel the sherd belonged to and can characterize some of the attributes of this vessel, these features are so general that no exact conclusions can be drawn from them about their origins and the influences that formed them. The same is true about the dating of the coarse wares: although there are some changes over time in the most frequent vessel forms, these still only allow the dating of the vessels within a very broad timeframe, nowhere near as exactly as it was with the fine wares.

As the aforementioned problems suggest, the coarse wares of the site can be divided into two main groups: a huge number of sherds with very limited information available about them, and a relatively smaller group that could be relatively well identified. In order to be able to involve both into the analysis I needed to obtain as much data about the latter as possible in order to be able to find certain patterns within that dataset that could be extended to the former based on some of the attributes that can be studied on every sherd, even the unidentified ones. During this process the previously mentioned pottery database was extremely helpful, since it allowed me the flexible grouping of the dataset, and the extraction of quantified data that was essential in the comparative analysis of the pottery material.

There were three main attributes that were the main focus of the analysis, since these could be recorded about every sherd: production technique, color of the fabric and quality. When looking at the total dataset both color and production method data shows similar tendencies. In the color of the fabric, grey sherds dominated, with 93% of the fragments belonging to this category, while yellow and red colored sherds only took up 3.8% and 3.2% of the total dataset respectively. A similar tendency can be observed by looking at the production technique: while 94.2% of the sherds came from wheel-made vessels, only 4.1% of the assemblage was made on a slow-wheel, and hand-made vessels took up only a mere 1.7% of the whole material. These datasets therefore show a similar distribution, both pointing towards a Romanized pottery material mostly made with a reduced firing technique (resulting in grey pottery), and using a wheel during production. If we look at the connection between these two attributes, however, some trends within the dataset come to light. By studying the manufacturing techniques of vessels of different color, we can see a relative similarity between grey and yellow sherds. Namely, both of these categories show ratios that are similar to the whole dataset, with wheel-made vessels in an overwhelming majority, while slow-wheel-made and hand-made vessels are both in short supply. Meanwhile, red-colored vessels show a starkly different picture, with only 69.6% of the vessels made on a wheel, and 26.1% of them made on a slow wheel. Hand-made vessels still only take up 4.3% of the material, but together with the relatively large percentage of slow-wheel-made vessels, the red-colored vessels (made by oxidized firing) show a trend that leads towards much lower quality than that of the grey and yellow vessels. It has to be said however, that the number of red-colored coarse wares (and therefore the dataset the statistics were based on) were much lower than that of the grey-colored sherds. However, since yellow-colored sherds were also in short supply, the fact that there is marked difference between their quality and that of the red-colored sherds shows that the trends observed here are real.

These observations are further underlined if we look at the quality of the tempering of the pottery material. Here we can see that even grey ceramics tend to have relatively, but not overwhelmingly coarse tempering, with 36.6% of sherds being of coarse temper-quality, while 46.5% were of medium-coarse tempering, and only 16.9% of the pieces having fine tempering. A similar, though slightly different trend can be observed within the yellow sherds: 37.1% of them had coarse tempering, while 33.3% were medium-coarse tempered, and 29.6% had fine tempering. This shows, that although generally the grey and yellow vessels were made with a similar technique, yellow coarse wares were of a slightly better quality. Looking at the sherds with red-colored fabric however, we can see a starkly different picture, with coarse tempering in an overwhelming majority with 78.3% of the sherds, while medium-coarse-tempered sherds only taking up 8.7%, and fine-tempered ones taking up 13% of the material.

This data further emphasizes the observations made above, namely that the vessels the sherds with red-colored fabric belonged to were generally of lower quality even within the coarse wares. While it is evident that coarse wares in general were of lesser quality than the fine wares (which is to be expected), yellow-colored vessels seem to have been of a relatively higher quality among them, with an overwhelming majority of them being made on a wheel, and a relatively high percentage of them being made with fine, or medium-coarse tempering. Grey potteries seem to be a relatively average category. While they are the most numerous of all coarse wares and are mostly made on a wheel, their temper quality is relatively lower than that of the yellow vessels. Meanwhile, the red-colored sherds seem to be of the worst quality, with a relatively larger percentage of them being made only on a slow wheel, and most of them having coarse tempering.

As can be seen from the above, some very interesting trends emerge about the quality of the coarse wares found at Ács-Kovács-rétek, with vessels made using different firing techniques showing a marked difference in quality. Question is: did this translate to them having different functions as well? To answer this question, I had to look at the quantities of different vessel types within the aforementioned subgroups.

It has to be kept in mind, though, that as previously mentioned, the number of identifiable sherds within the dataset was relatively low, and with the grey-colored sherds in such an overwhelmingly large majority, the dataset of yellow- and red-colored sherds was relatively low, and thus could alter the results. However, the fact that the percentage of identifiable sherds within the different color-types was very similar[133] gives statistical relevance to the dataset.

Similarly to the previously mentioned analyses, this dataset also showed several trends that followed the previously established quality-based coarse ware categories. Therefore it was possible to draw up three distinct groups within the dataset:

- Vessels with yellow-colored fabric: this group contains the highest percentage of high quality sherds among the coarse wares, with the majority made on wheel. Every one of the identifiable pieces came from dishes, which underlines the probability that these vessels were mostly used as tableware, and were the best quality items among coarse wares.

133 Of the 675 known grey coarse wares, only 81 could be identified (12%), while for yellow sherds this number is 3 out of 29 (10.3%). The number of identifiable red colored sherds is slightly higher, with 5 out of 24 (20.8%).

- Vessels with grey-colored fabric: by far the numerically largest group within the coarse wares. While they are still generally well-made, their quality is markedly lower than that of the yellow-colored vessels. With regard to vessel types, this group is the most varied of all, most of them being pots and dishes, with a number of storage vessels, jars and pouring vessels also identifiable. This variety and their large quantity shows that these are the average coarse wares of the site, used for almost every function from storage and cooking to tableware.

- Vessels with red-colored fabric: generally made with low-quality materials, mostly formed by hand, these are the crudest of the coarse wares at the site. The only identified vessel forms are pots, which shows that these vessels were mostly utilitarian, probably mostly used for storage.

The results detailed above show that even though there are a number of problems associated with the coarse wares of the site, some trends could still be observed in the material, thanks to the structured data handling and the quantitative capabilities of the database. While only a few of the sherds could be identified exactly, the trends within this dataset can be used to better understand even those that could not be identified.

These trends, however, while very important in understanding the usage of these vessels, don't tell us about their possible origins and chronology. To answer these questions, we have to look at the different vessel types individually.

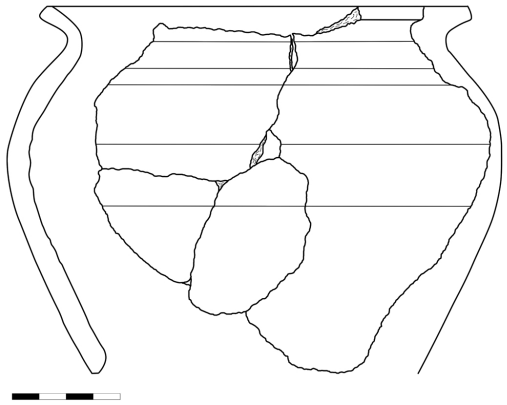
3.1.3.1. Pots

The largest number of identified coarse wares in the assemblage were pots, with a total of 55 known vessels. Since no full profile was found, the vessels were categorized by the shape of their rims.

The fact that pots are mostly utilitarian vessels shows in their quality. Their tempering quality is generally skewed towards coarser tempering (28 pieces, 50.9%), while medium-coarse-tempered vessels took up 45.5% (25 pieces) of the assemblage, with only 3.6% (2 pieces) being of fine tempering. Every single one of the pots was either grey or red colored, with grey vessels being the most dominant in numbers. Only a few of them had any decoration, five of them having incised linear decoration, and a further two of them having ribbed decoration. This is a good evidence of them being mostly functional vessels, probably used for cooking. This fact is underlined by the 14 instances in which traces of secondary burning could be found on the exterior surface, most probably due to their usage on an open fire.

Their forming also shows signs of their utilitarian nature. Most of them had simple forms, generally with an outcurving rim, widened shoulder and a flat base. Their only possible categorization was based on the shape of their rims. Of these a total of 12 categories[134] were formed, out of which 11 had various forms of outcurving rims, and only one with an inverted rim *(Fig. 11, 12, 13.1)*. This shows the relative variety of the assemblage, in which quite a number of different rim types could be identified, most of them having several analogues. Still, their dating was only possible in a very wide timeframe. The only chronological change that could be observed was between the Early and Late Roman Ages, when the characteristic rim types changed, therefore giving an opportunity to at least loosely date some of the categories observed in Ács-Kovács-rétek.

134 For the detailed description of the different categories, see Vágvölgyi 2013, 91–93.



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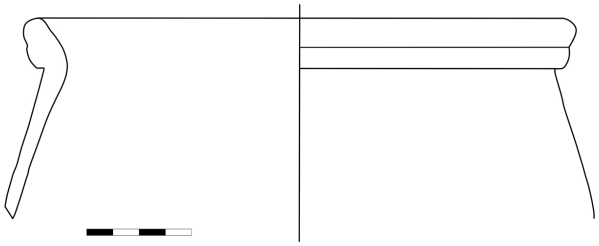

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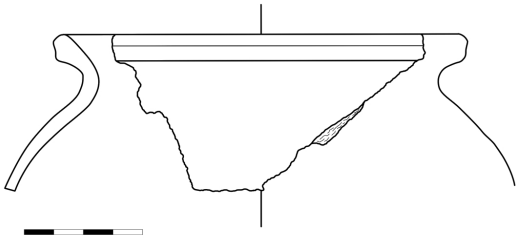
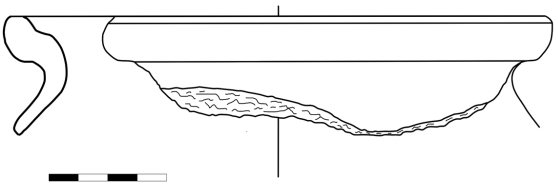
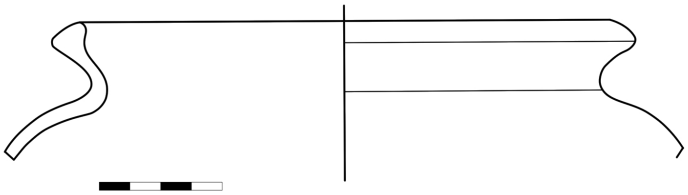


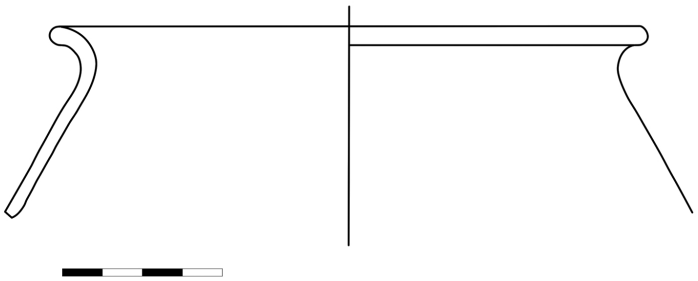
3. = 01.67065.53.6



4. = 01.67065.22.6



5. = 01.67065.200.16



6. = 01.67065.68.4

Fig. 11. Coarse ware pots from the site.

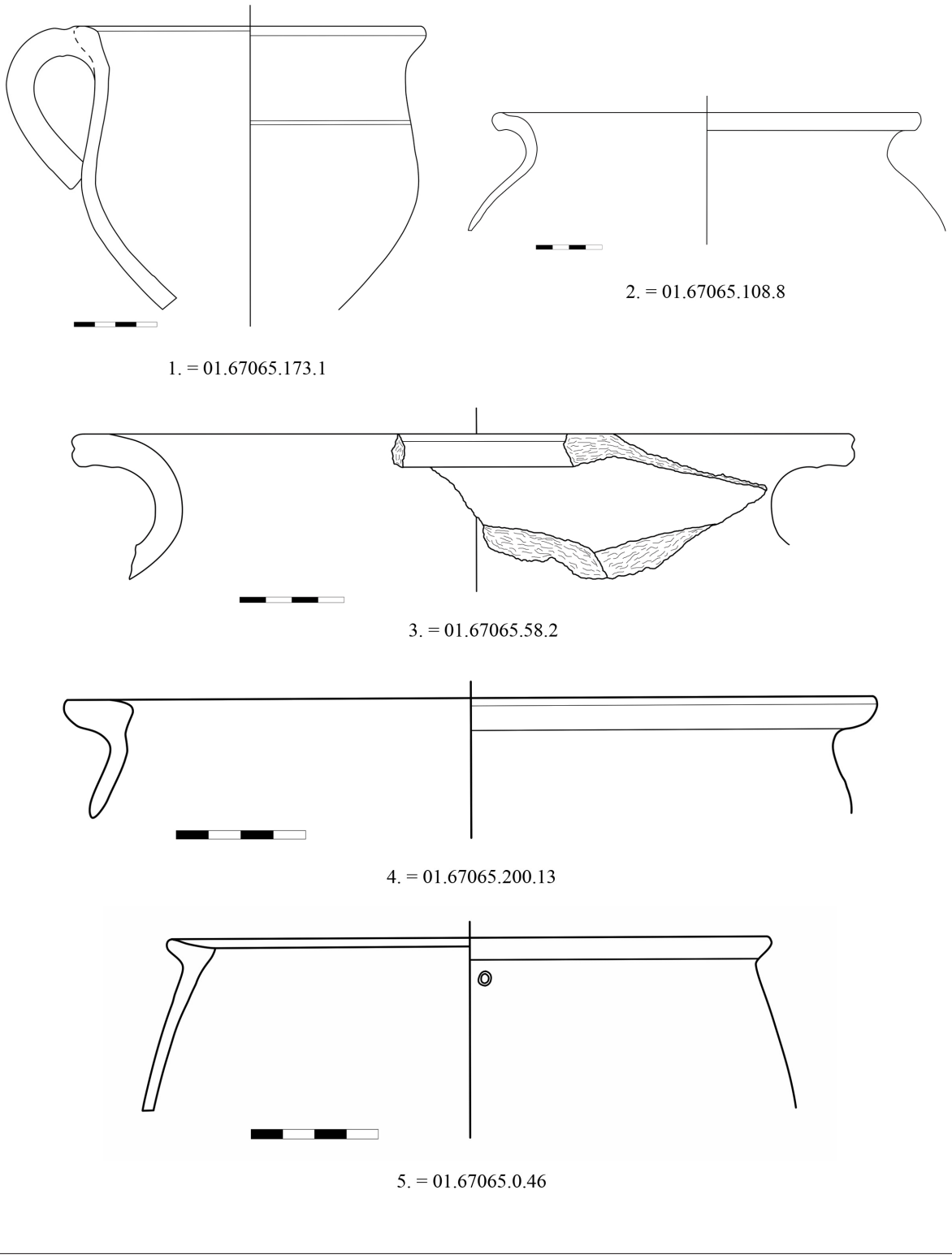


Fig. 12. Coarse ware pots from the site.

Most of the categories had geographically wide-ranging analogues within the province, which shows that these utilitarian vessels were probably mostly locally made, and had quite general forms throughout Pannonia. A good example of this is the Early Roman pot assemblage, analogues to which have been found both in Budaörs-Kamaraerdő-dűlő,[135] Carnuntum,[136] and Fertőrákos-Golgota.[137]

While some of the characteristic rim types change in the Late Roman period, the wide-ranging geographic scatter of the analogues for the pots remains, with similar vessels found in Ács-Vaspuszta,[138] Leányfalu,[139] Budaörs-Kamaraerdő-dűlő,[140] Tokod,[141] Szakály-Rétiföldek[142] and Carnuntum.[143]

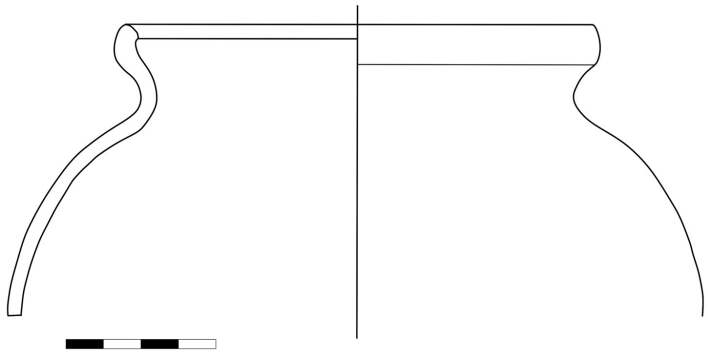
As it can be seen from the above, the pots of Ács-Kovács-rétek have a wide range of analogues from around the province. While there is a number of them from the Early Roman period, it has to be noted that the vast majority of vessels belonged to Late Roman types (six types), and even from the rest, four more belonged to both Early and Late Roman contexts (meaning long-living vessel forms), leaving only one type with only Early Roman analogues. This shows a notable skew towards Late Roman vessel types with a lower influence by Early Roman coarse wares, which fits well into the timeframe established by the fine wares studied earlier.

3.1.3.2. Dishes

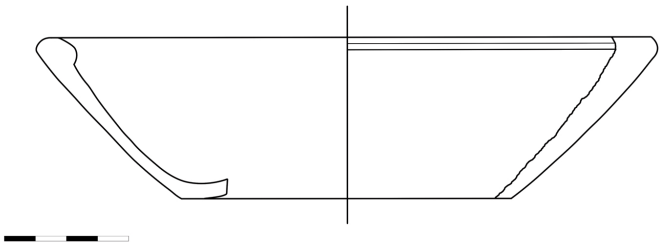
After the pots, dishes were the most numerous coarse ware forms to be found at Ács-Kovács-rétek. A total of 26 sherds have been identified as such, three of them being full profiles. Their quality is generally better than that of the pots: while a relatively big percentage of them were made with fine temper (8 pieces, 30.8%) and medium-coarse temper (13 pieces, 50%), coarse tempering was only observed in 5 pieces (19.2%). This suggests that the dishes were relatively more representative, being used as tableware. This is further underlined by the fact that all of them were made on a wheel. The majority of the vessels were grey of color, with only two being yellow. Any form of decoration was rare among them, with only two having incised linear decoration, and another two having ribbed decoration.

Their shapes show a much more unified picture than that of the pots, with only three different identifiable types *(Fig. 13.2–4)*.[144] Most of the vessels had inverted rims, with outcurving or straight rims in a small minority. Their bases are mostly flat. Similarly to the pots, their analogues are very wide-ranging, although every one of them comes from the Late Roman age. Similar pottery forms have been found in Budaörs-Kamaraerdő-dűlő,[145] Leányfalu,[146] Ács-Vaspuszta[147] and Szakály-Rétiföldek.[148]

135 Ottományi 2012, Fig. 198.1–3, 9–10; 201.9.
136 Grünewald 1979, Abb. 38.7; 44.4, 6, 8, 11, 13; 48.9; 80.1; 82.2.
137 Gabler 1973, Fig. 15.16, 17, 19; Fig. 7.
138 Gabler 1989, Fig. 119.57, 124.17, 127.42, 129.20, 130.28, 131.36.
139 Ottományi 1991, Fig. 22.6/c, 23.10, 26.29, 31.58/a.
140 Ottományi 2012, Fig. 199.9, 200.5.
141 Mócsy 1981, Abb. 1.1, 7; 20.2–3.
142 Gabler 1996, Fig. 14.14.
143 Grünewald 1986, Abb. V.10.
144 For a detailed description of the different types, see Vágvölgyi 2013, 94–95.
145 Ottományi 2012, Fig. 189.19, 194.5.
146 Ottományi 1991, Fig. 1.6.
147 Gabler 1989, Fig. 113.6, 8.
148 Gabler 1996, Fig. 17.15.



1. = 01.67065.147.28



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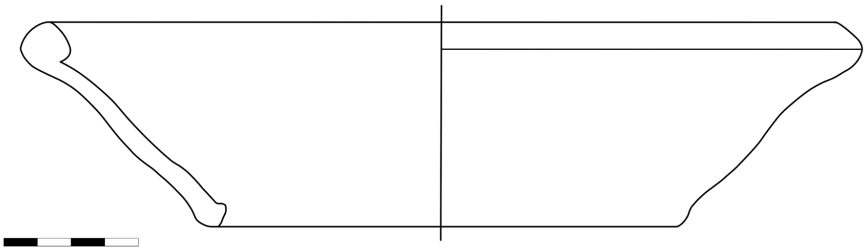

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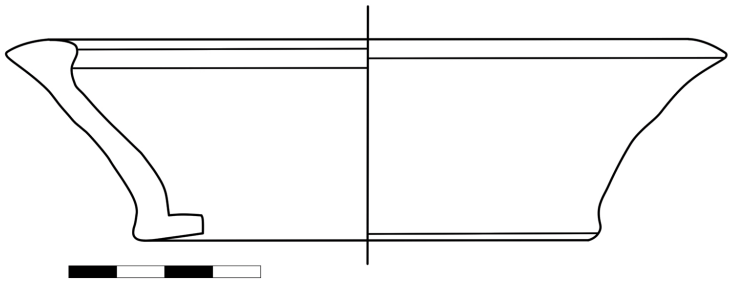

4. = 01.67065.146.01

Fig. 13. Coarse ware pots (1) and dishes (2–4) from the site.

In summary, while we can see that the dishes are of slightly better quality than the pots found in the material, they are in many ways (like their geographically wide-ranging distribution) similar to them. They also fit well into the timeframe of the settlement with their Late Roman-focused analogues.

3.1.3.3. Other vessel forms

Aside from pots and dishes, not many other vessel types could be identified within the coarse wares. The few include two pieces from jugs, two from large storage vessels, and one from a pouring vessel.

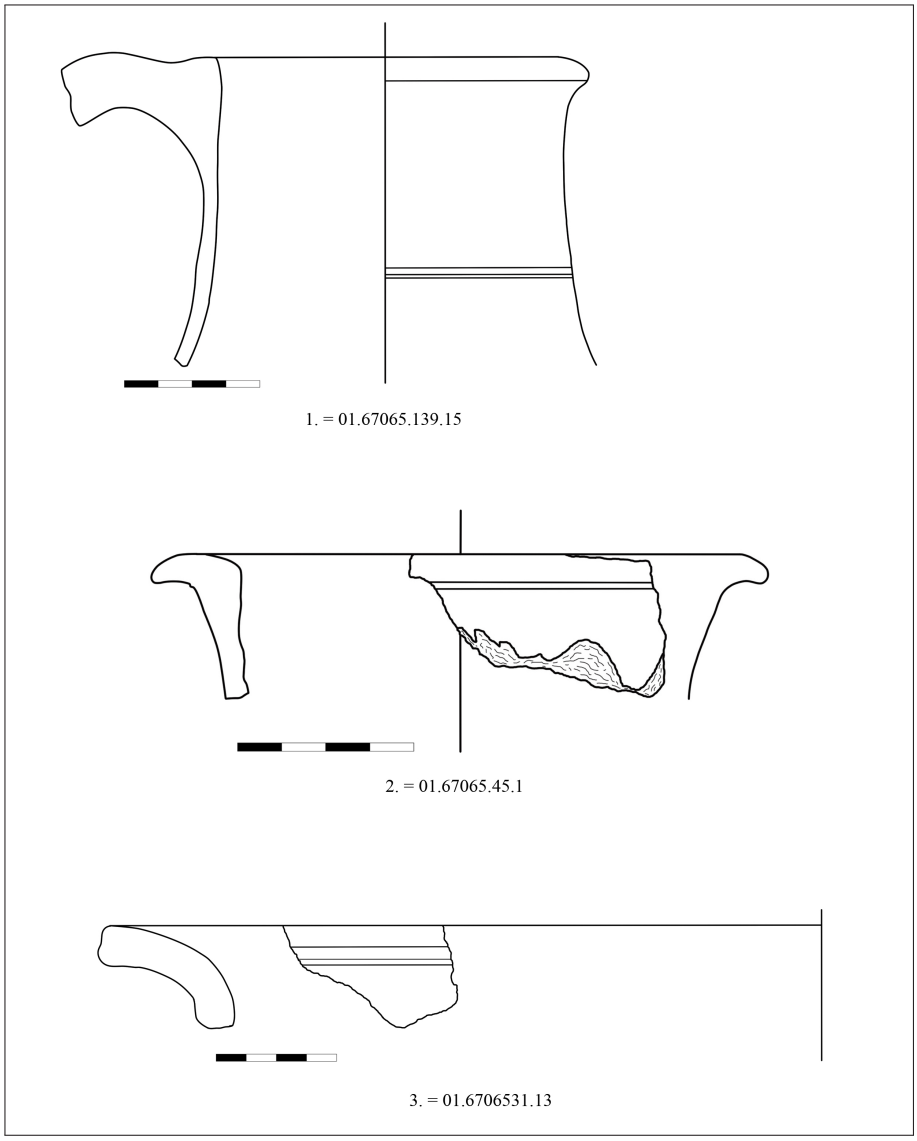

Fig. 14. Coarse ware jug (1) and unidentifiable coarse ware vessels (2–3) from Ács-Kovács-rétek.

Out of the two pieces belonging to jugs, only one could be identified in detail *(Fig. 14.1)*, one with coarse tempering, grey-colored fabric, and one looped handle. It is still unclear whether the original vessel had more than one handle, although its only known analogue (a vessel from Carnuntum[149] dating to the 2nd century AD) only had one.

149 Grünewald 1979, Abb. 31.6.

Two of the other identifiable sherds from the assemblage belonged to large storage vessels. Both of them are grey of color. Their quality varies, with one having coarse tempering, and the other being slightly better with medium-coarse tempering. Neither of them belong to the rim of the vessels, therefore no analogues could be found. Their identification was based on the very large diameter of the original vessel reconstructed from the inflection of the pieces. Both of them had brushed decorations, which is mainly attributed to Early Roman storage vessels, although according to Katalin Ottományi, they were still present in the Late Roman period, though in smaller numbers.[150]

Aside from the jugs and storage vessels mentioned above, only one other pottery piece could be identified. This was a sherd with medium-coarse tempering and gray color, which belonged to the bottom of a pouring vessel. The piece itself was too small to help determine the exact form of the vessel, although the rectangular holes cut through the body (similar to those found on fine wares) clearly identify it as a pouring vessel.

No other vessel forms could be identified from the coarse wares of Ács-Kovács-rétek. And while this data already shows interesting trends about the inhabitants and the chronology of the site, we must keep in mind that this detailed analysis only covered 17% of the total number of coarse wares. If we look at the whole assemblage, there is still 629 more sherds of coarse wares that could not be identified exactly,[151] and could only be used in the statistical analysis of the find material. The aforementioned ratios of vessel forms are still only based on a fragment of this assemblage, and therefore it is possible that the breakdown of the total material was different. In order to affirm the validity of the numbers shown here, we still need more study, and a more effective way of identifying vessel types.

3.1.4. Summary of the pottery material found at Ács-Kovács-rétek

By studying the pottery material found at Ács-Kovács-rétek, a lot has become clearer about the settlement that would have been impossible to find out otherwise. Both the general quality and the production method of the vessels shows signs of a provincial population. Furthermore, the presence of the different fine ware types indicates a definitely Romanized population that used characteristically roman pottery types (such as the imitations of Pompeian red wares or Samian wares), and had Romanized eating habits as well, a fact evident from the glazed *mortaria* found at the site.

The analysis also helps establish the timeframe of the settlement. According to the earliest pieces found in the material, it was probably already active in the late 3rd century AD, while the youngest sherds show that the end of its habitation probably fell around the middle or the third quarter of the 4th century AD.

Since no evidence of pottery production was ever found at Ács-Kovács-rétek, it is more than probable that the pottery material got to the settlement via a regional trade network most probably centered on Brigetio. The analogous information clearly supports this, with most of the well identifiable fine wares having at least some kind of connection to the town.[152] Furthermore, the lack of imported pottery (aside from the two small Samian ware sherds)

150 Ottományi 2012, 253–255.

151 For examples of not exactly identifiable vessels, see *Fig. 14.2–3.*

152 For further information, see Fényes 2003.

shows that while the settlement was relatively close to not only the Danube but one of the military establishments as well (namely the fort of Ács-Vaspuszta), its trading network was probably relatively small and regional.

While this information improves our understanding of the settlement, there are still many questions that the pottery material alone cannot answer. In order to refine our knowledge, we need to study the other artifacts found at the site as well.

3.2. Clay, metal and bone objects from the settlement of Ács-Kovács-rétek

Although the majority of the find material from the site consisted of pottery, a number of other types of finds were also found as well. The analysis of these items is very important, since they can help to make the characterization of the settlement more accurate by giving the opportunity to look at the inhabitants from a different angle. One of these important aspects is the question of the settlement's agricultural or industrial function, which is still questionable. Also, while the pottery material shows a distinct timeframe for the settlement, the more unique finds could help a lot to refine it.

3.2.1. Terracotta objects

3.2.1.1. Utility items

During the course of the excavation, only one terracotta item was found at the site which served mainly utilitarian purposes. This is a spindle-whorle from house No. 93 in the core of the settlement. The form of this whorl is round and flat, with a hole through the middle. Since the shaping of such an item is mostly utilitarian, analogues of it can be found not only throughout the province,[153] but from other eras as well.[154] The exact dating of the spindle-whorl found at Ács-Kovács-rétek is therefore impossible. However, it serves as a good example (especially since it was found in one of the houses) that the settlement was home to at least some degree of home industry.

3.2.1.2. *Tegulae*

A number of pieces of *tegulae* and *imbrices* were found at the site, most of which came from the filling of pit houses. While they don't make any exact reconstruction possible due to their small size, they indicate that a number of buildings at the site could have had tiled roofs of Roman character.

Only one of the *tegulae* fragments had a stamp on it, with the fragment of a word on it written backwards, spelling most probably "[R]IAN". There is currently no exact interpretation for this text, and analogues for it are not much help either. The only analogues for it come not from the military, but from a civilian find: in 1868 a grave built out of bricks was found during the excavations of Arrabona, with the text "ARIANIS" stamped on it.[155] Since neither the grave nor the *tegula* used for its construction can be dated or its origins pinpointed, this analogue doesn't allow the *tegula* found in Ács-Kovács-rétek to be dated. Especially since the text "[R]IAN"

153 Ottományi 2012, Fig. 220.

154 A good example of this is the spindle whorl found at an Avar period site, as published in Bóna 1973, Fig. 4.9, 14.

155 CIL III, 11459; Lőrincz 1981, Taf. 14.4.

found on the fragment was just a part of the original text, and therefore the full text could possibly have differed from that one found in Arrabona.

3.2.2. Metal objects

A number of different type of metal objects were found during the excavation, both made out of iron and bronze. The items made out of bronze were all identifiable as parts of clothing, while those made from iron were more utilitarian in nature. An interesting exception to this is the case of the 69 bronze coins found scattered around the site, the analysis of which helps us greatly in the interpretation of the settlement.

3.2.2.1. Coins

A total of 69 coins were found at the site of Ács-Kovács-rétek.[156] Every one of these came as scatter-finds, with the exception of three that were found in features of the site. However, the coordinates recorded at the time of their finding tie the remaining 66 coins to the settlement as well.

Without exception, every single coin was made out of bronze. However, an exact denomination could not be identified for any of them, therefore their sorting had to be based on their sizes instead. Every coin from the assemblage came from the 4th century, with the earliest being issued by Constantius I. in 313, and the latest a coin by Valentinian I from between 364–375. In addition, a number of coins at the site were issued by Licinius, Crispus, Constans, Constantius II, Iulianus II, Helena, and there were a number of coins with the inscription "Urbs Roma" as well.

While these coins provide very good chronological context for the settlement, it has to be stated that the accuracy of their dating varies. Due to their worn-our condition, a total of eight coins could not be identified exactly, and therefore could only be dated to the 4th century AD. Even when the coins could be identified, many of them could only be dated within a 10–15 year time period. This is especially true to the later coins issued in the Valentinian period, none of which could be dated more accurately than to within 10 years. This varying degree of accuracy in dating made the chronological interpretation of the coin assemblage, and therefore the coin circulation of the settlement very difficult, because I had to fit different time intervals into the same model. The solution to this problem lay in the method developed by Ferenc Redő and Péter Somogyi, using a cumulative histogram to record the changes in coin circulation at a site.[157] For the purposes of this analysis an arbitrary time interval was designated, and thus the timeline of the coin circulation was divided into smaller sections. For every section the number of coins dating to that period was recorded. If the dating of a coin fell into more than one arbitrary time intervals, then it was recorded for every one of those units as an individual find. The arbitrary time interval for this calculation was set at five years. This was optimal for this particular dataset, because with a shorter interval the coins in better condition (and thus more accurate dating) would have caused too much noise. With an interval longer than five years, however, the histogram would have been too general and would not have given enough detail because of the relative shortness of the time period the coins generally fall into (only one century).[158]

156 The identification of the coin material was carried out by Ferenc Redő, for which I'm very grateful.
157 For a detailed explanation of the method see Redő – Somogyi 1995.
158 Redő – Somogyi 1985, 37–38.

After recording the data, the histogram was made in two different variations: the first contained every single coin found at the site, while the second one contained only those that could be dated with at least 20 years of accuracy. The results show that the two did not differ fundamentally, except that the different changes were more articulated, and thus better interpretable, since the noise attributable to those coins dated with a 100 year accuracy was discarded. Therefore the latter was used for the actual interpretation process.

It is important to note however, that the histogram, and therefore my whole analysis is based on the date of issue of the coin. As such it does not consider the time the coins were in use, which for the 4th century AD is estimated by Ferenc Redő to be approximately 24 years.[159] This causes the results to be slightly distorted, since the data shows the time of mintage, and not the actual burial date. A possible solution to this problem could be to use a method also developed by Ferenc Redő called "smoothing",[160] which could correct the results with these factors in mind. Given however, that the data from other sites that was used for comparison did not have this correction applied, this calibration was also not used during my study.

The histogram that results from the sorting discussed above draws a clear picture of the coin circulation of Ács-Kovács-rétek, and all the changes in it that occurred in the 4th century AD. By comparing this picture to similar data from other sites, we can draw very important conclusions about the site's history, and possible differences from general trends in Pannonia.

According to the data, the circulation in Ács-Kovács-rétek shows a slight increase after the appearance of the first coins in 313. It reaches its overall peak at the 340s with some smaller slumps beforehand. During the 350s there is a short-time setback with the 360s showing a rise in circulation again. Afterwards however, by the second half of the 360s the number of coins show a definite decline, which leads to the disappearance of coins by the middle of the 370s.

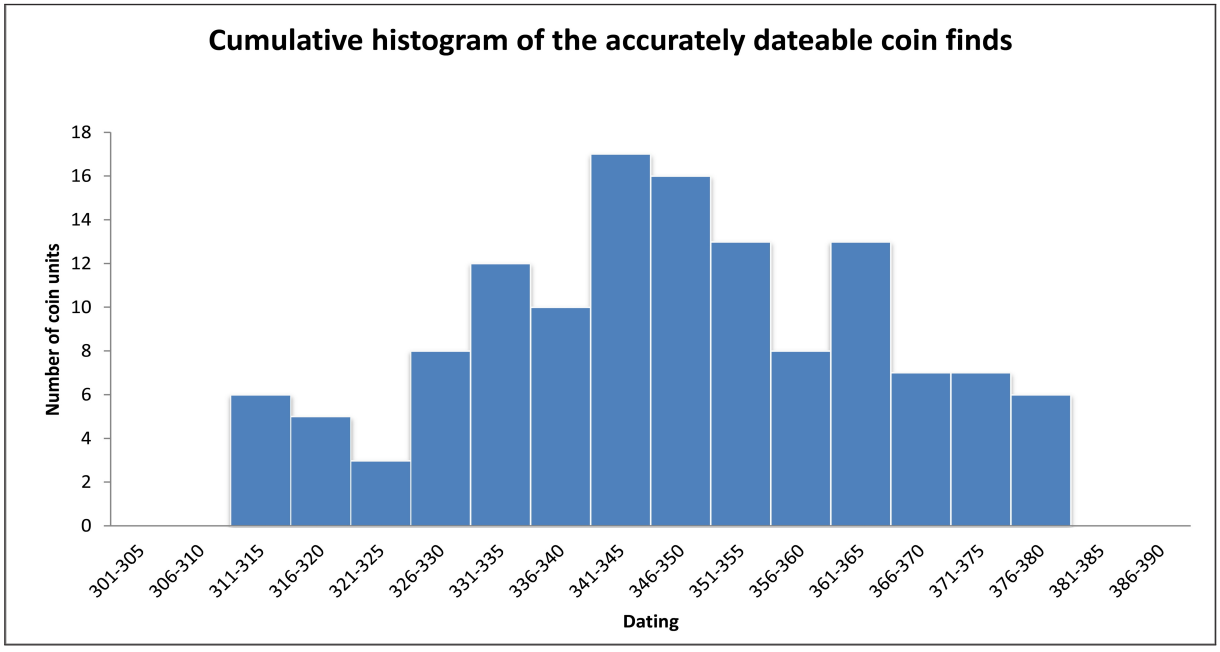

Fig. 15. Cumulative histogram of the coin circulation of Ács-Kovács-rétek, based on well dateable finds.

159 Redő 2008, 376.
160 See Redő 2008

If we compare these trends to those of other sites in Pannonia, we can see that the patterns observed here fit well into the standard trends visible around the province, only with one major difference. While during the reign of Valentinian I there is a marked increase in coin circulation (related to the buildup at the *Ripa Pannonica*) throughout Pannonia,[161] this increase is not present in the material of Ács-Kovács-rétek. The exact cause of this is still uncertain, although given that the number of other finds dating to the second half of the 4th century AD (including the low percentage of burnished pottery) is also relatively small, it could have been that the settlement was already in strong decline by that time.

As the data shows, the general trends of Ács-Kovács-rétek mostly follow those of the whole province. However, there are several smaller slumps and increases during the whole time. Question is: are these similar to trends from other settlements as well (meaning they were caused by some province-wide phenomenon), or are they unique, meaning that their cause was something local?

If we look at the trends within the pottery material of the site it becomes evident that Brigetio (the closest town to the settlement) played an important role in the life of the village, and was probably one of the main trade hubs the inhabitants had an economic connection with. If we look at the comparison of their coin circulation however, several differences are visible.[162] While the number of coins in Brigetio also start to rise in the 310s (after a small setback earlier), their increase is continuous up until the 340s. The small setbacks visible in Ács-Kovács-rétek in the 320s and 330s are not present in this material, leading to the possible conclusion that those were caused by some local factor. Additionally, the sharp increase in circulation during Valentinian I is present in Brigetio, therefore its absence in Ács-Kovács-rétek can also be attributed to some local phenomenon instead of regional trends.

Aside from Brigetio, another very important place to look at would be Ács-Vaspuszta, an auxiliary camp relatively close to the settlement. Sadly, only a small number of coins are published[163] from here as of yet, which doesn't allow for a statistical analysis. There is, however a coin hoard that was found in the ruins of one part of the fort that indicates that the fort was attacked, most probably in 354–355. This attack caused parts of the fort to be destroyed.[164] The effects of this raid, however, cannot be found in the coin circulation of Ács-Kovács-rétek, which could show that it was not affected by this event.

Similar trends to those of Brigetio can be seen throughout the whole province, for example in Intercisa[165] and Salla.[166] The similarities between the two show that the presence of the military did not necessarily influence the major trends of coin circulation, since while Salla was mostly civilian in nature, Intercisa was located at an auxiliary fort. Both of them are towns, however, therefore it is important to look at the circulation of smaller settlements as well, to compare to the rural settlement of Ács-Kovács-rétek. Very important in this regard is the work of Melinda Torbágyi, who studied the coin circulation patterns of both Páty-Malom-dűlő and

161 Bíró-Sey 1977, 14.
162 For information about the coin circulation of Brigetio, see bíró-Sey 1977.
163 Redő 1999, 42–43; Lányi 1989.
164 Gabler 1972, 235.
165 Bíró-Sey 1977, 19.22.
166 Redő 2007, 15.

Tokod. Her analysis shows that the trends at these rural settlements are the same as those of the towns, leading to the conclusion that these major patterns were not influenced by the relatively larger economic power of the urbanized centers or the military.

The aforementioned similarities show that there are province-wide patterns in the coin circulation of Pannonia, which are also evident in the case of Ács-Kovács-rétek. The marked differences that do appear seem to be the result of some local phenomenon, including the sharp decline in the 360s and 370s. This could indicate that the settlement was abandoned around this time (which is also affirmed by a number of other finds). However, the exact reason for this is still questionable.

As we can see from the above, the coins of Ács-Kovács-rétek provided very important information about the chronology of the site, showing that it fit well into the average of the province. A number of other attributes, however, still need to be examined in order to understand every aspect of the coin circulation of the settlement.

One of these factors is the mintage of the different coins in the assemblage. Sadly, this attribute was only identifiable in the case of half of the coins, while the rest was too worn-out to be readable. Still, the study of this information draws a very diverse picture.

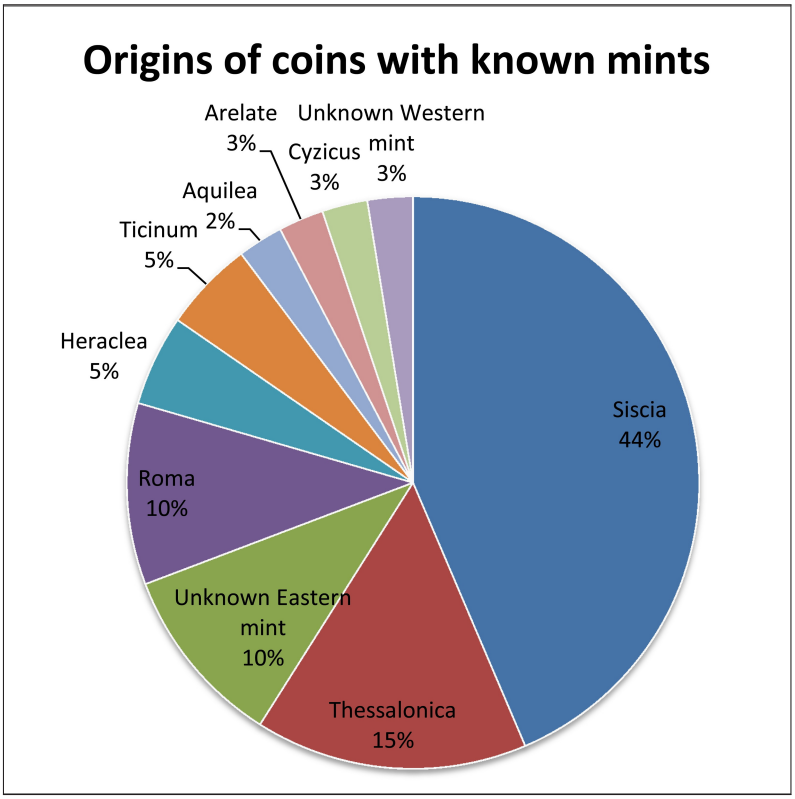

Fig. 16. Distribution of known mints of the coin material of the site.

The mint with the largest representation within the assemblage was that of Siscia, with a total of 17 coins originating from there. This fits well into Pannonian standards, where in the Late Roman age Siscian coins were the most frequent in most assemblages.[167] Another important mint in the material of Ács-Kovács-rétek was that of Thessaloniki (six pieces) and Rome (four

167 Bíró-Sey 1977, 25; Lányi 1969.

pieces). In addition, the mints of Heraclea, Ticinum, Aquilea, Arelate and Cyzicus are also represented, although only in minimal numbers.

These numbers show a very diverse origin for the coins, with three main sources, and several minor ones. This on the one hand fits well into the picture of an everyday monetary circulation, while on the other hand is similar to those of other sites in Late Roman Pannonia: a good example of this is the coin circulation of Brigetio.[168]

It is important to note, however, that the study conducted above is based solely on the number of coins, and not their monetary value. This factor is important, since by the Late Roman age, the value of individual coins was well below that of the Early Roman age,[169] and therefore even a large coin assemblage could have had a lower overall value than that of a smaller, but earlier one.

However, since the exact denomination of the coins was not discernible, the only way to ascertain their value was by measuring their size and weight. This method is relatively common among Late Roman coins (most of which we do not know the denomination for), and thus the coins of Ács-Kovács-rétek could be sorted well into three main categories according to their sizes:

- size AE2: 12 pieces (17%), average weight 3.33 gr.
- size AE3: 42 pieces (61%), average weight 1.92 gr.
- s0ize AE4: 15 pieces (22%), average weight 1.47 gr.

We can see from this data that the most frequent coins in the assemblage were those with an AE3 size, while both smaller and larger coins occur in a relatively smaller percentage. While the categorization was based on the size of the coins, the weight of each coin in a group can vary. Because of the fact that in the Roman era the weight of a coin was at least as important in respect to their value as their size and denomination, the distribution of coin weights within each group could similarly tell us about monetary patterns.[170] One of these patterns is the effect of currency devaluation, a sign of which (according to Ferenc Redő)[171] is the negative skewness in the Gaussian distribution of coin weights within the groups.

By studying the Gaussian distribution[172] of the statistically relevant coin weight data,[173] some interesting patterns emerged. The results show that the distribution of the different groups is relatively standard, without any skewness towards either good- or bad quality. The only difference within the groups was in their scatter: while the AE2 and AE3 sized coins show a relatively large scatter (meaning an inconsistent coin quality), the scatter of AE4 coin weights is relatively low, meaning they had a more consistent quality. The exact cause of this discrepancy is currently unknown. Still, this data shows that there is two groups within the coin assemblage, with the two largest types being relatively fluctuating in quality, and the smallest of the three being relatively stable. The question is: is there a correlation between the aforementioned

168 Bíró-Sey 1977, 24–25.
169 Torbágyi 2007, 276.
170 For a detailed explanation of these patterns and the exact data, see Vágvölgyi 2013, 106–111.
171 Redő 1975, 63.
172 For an explanation of Gaussian distributions and their study, see Williams 1979, 39–51.
173 During the analysis a small number of coins had to be removed from the dataset due to their highly abnormal attributes (probably due to their bad condition) that could have distorted the results of the analysis.

quality fluctuation and the dating of the coins within the groups, which would mean that the quality got worse over time? Can this be attributed to currency devaluation?

To answer these questions, I had to turn to correlation analysis.[174] For the sake of the statistical relevance, a few extreme values (attributed to extremely low quality coins) have been removed from the dataset.

Among the results, one of the most interesting is that produced by the coins in the size-group AE2, showing a very weak positive correlation between the two variables (time and weight). This means that the weight of these coins actually grew over time, although the correlation itself was very weak. The exact interpretation of this phenomenon is still questionable, although it has to be noted that all of the coins were dated to later than the end of the 340s, meaning that this particular dataset did not cover all of the timeframe of the assemblage.

If we look at the coins in the AE3 and AE4 size-group, we see a different picture, with no correlation between the variants whatsoever. This means that the fluctuation of the coin quality in these groups was relatively random in respect to their dating, without any patterns over time. The same can be seen when studying the standard values of the whole coin assemblage, meaning that there is no discernible evidence of the coins getting lighter, and therefore devalued over time. It is therefore likely that the fluctuation in in weight can be attributed either to the generally low quality of the coins, or to some taphonomic reasons yet unknown.

In summary, we can see that the coin assemblage of Ács-Kovács-rétek fits well into the general provincial trends both in respect to its circulation and the composition of the material. This proves that although the settlement shows signs of relative poverty (with respect to the general composition of its find material), it was indeed part of Pannonia's economic system. Although there are some differences in its coin circulation, these are probably due to some local phenomenon, as currently there is no evidence of any regional disturbances that could be attributed to these variations. The analysis of the coin circulation also helps to refine the timeframe of the settlement: while the earliest coins date to the 10s of the 4th century AD and not to the end of the 3rd century AD(as suggested by pottery finds), the sudden decline observed in the 360s and 370s underlines similar trends within the pottery material that suggests that the end of the settlement falls roughly around this time.

The statistical analysis of the material also shows that the coins found at the site were of relatively low and fluctuating quality. While no correlation can be seen in this dataset, there are several other factors (like the possible connection between coin quality and origin) that could not be analyzed, and needs further study. It is even more important to have detailed analyses of coin assemblages from other sites as well, since comparison between these datasets is key to finding regional discrepancies in the coin material of Pannonia.

3.2.2.2. Bronze objects

Aside from coins, only nine other artifacts found at the site were made of bronze. Out of this nine, only five could be identified exactly, every one of them as accessories of clothing. Most of them were found as scatter finds during the excavation, and their overall condition made the

174 For a detailed explanation of correlation analysis and the methodology used during my study, see Williams 1979, 121–136.

identification and interpretation process quite problematic. In some cases however, analogues could be found which dated those finds exclusively to the 3rd and 4th centuries AD.

The two most interesting finds are the two bulb-headed *fibulae* fragments found as scatters at the site *(Fig. 17.1–2)*. One of the fragments was identified as the head of a *fibula*, while the other belonged to the foot of one. The two pieces don't fit together, therefore it is improbable that they belonged to the same *fibula*, and the stirrup part that would be necessary to connect them has not been found.

The bulb-headed *fibula* type itself is a characteristic type of the 4th century AD found throughout the Empire. Its first occurrences are at the end of the 3rd century AD, while its use probably survived up until the 5th century AD.[175] The wearers of this brooch-type were mostly soldiers and officers, therefore these items are mostly attributed either to the military or the provincial administration.[176] This is underlined by their uniform shaping, which points towards them being produced centrally, probably in workshops connected to the government.

Both of the fragments found at the site were in quite bad condition, therefore their exact interpretation was problematic. In the case of the head-part, only the two bulbs at the end of the cross-arm were found, while the one that should have been at the end of the stirrup-part is missing. The cross-arm itself is without decoration, its cross-section rectangular in shape. Both of the bulbs are relatively low in quality, with their width bigger than their length. In the case of the foot-part fragment also known from the site, the shape is trapezoid, with two decorations in the shape of double concentric circles at the narrower end, where the stirrup-part should have connected to it.

While it is still unclear if the two fragments are parts of one or more *fibulae*, their analogues can be found in brooches from several sites. Within Pannonia, brooches with similar parts have been found in Budaörs.[177] A good example of their Empire-wide uniformity is the fact that a similar brooch has also been found in Lauriacum in Noricum.[178] Their characteristics put both of them in the Keller-Pröttel Type No. 3–4, which Ph. M. Pröttel dates to between 330 and 400.[179] According to this classification, the two fragments found in Ács-Kovács-rétek could also date to this period, which fits into the later part of the settlement's established timeframe. Sadly, given the condition of the fragments, there was no possibility for a more accurate identification of the finds, although they still are very important, as they show well that the settlement had at least some degree of connection to the Roman administration.

Beside the aforementioned *fibulae*, a small fragment of a ring made from bronze is also known from the site *(Fig. 17.3)*. It has a flat, rounded, oval-shaped top part, from which starts the very thin band (with a cross-section of only 1 × 1 millimeters) of the ring itself, of which only the upper part is known, therefore the whole diameter of the ring cannot be reconstructed. The top part is decorated by the faint engraving of a figure, which cannot be properly identified due to its condition, although it is possible that it depicts an animal of some kind.

175 Merczi 2012, 501.
176 Patek 1942, 73.
177 Merczi 2012, Fig. 10.1–2, 4.
178 Jobst 1975, Taf. 34.248.
179 Pröttel 1988, 357–364.

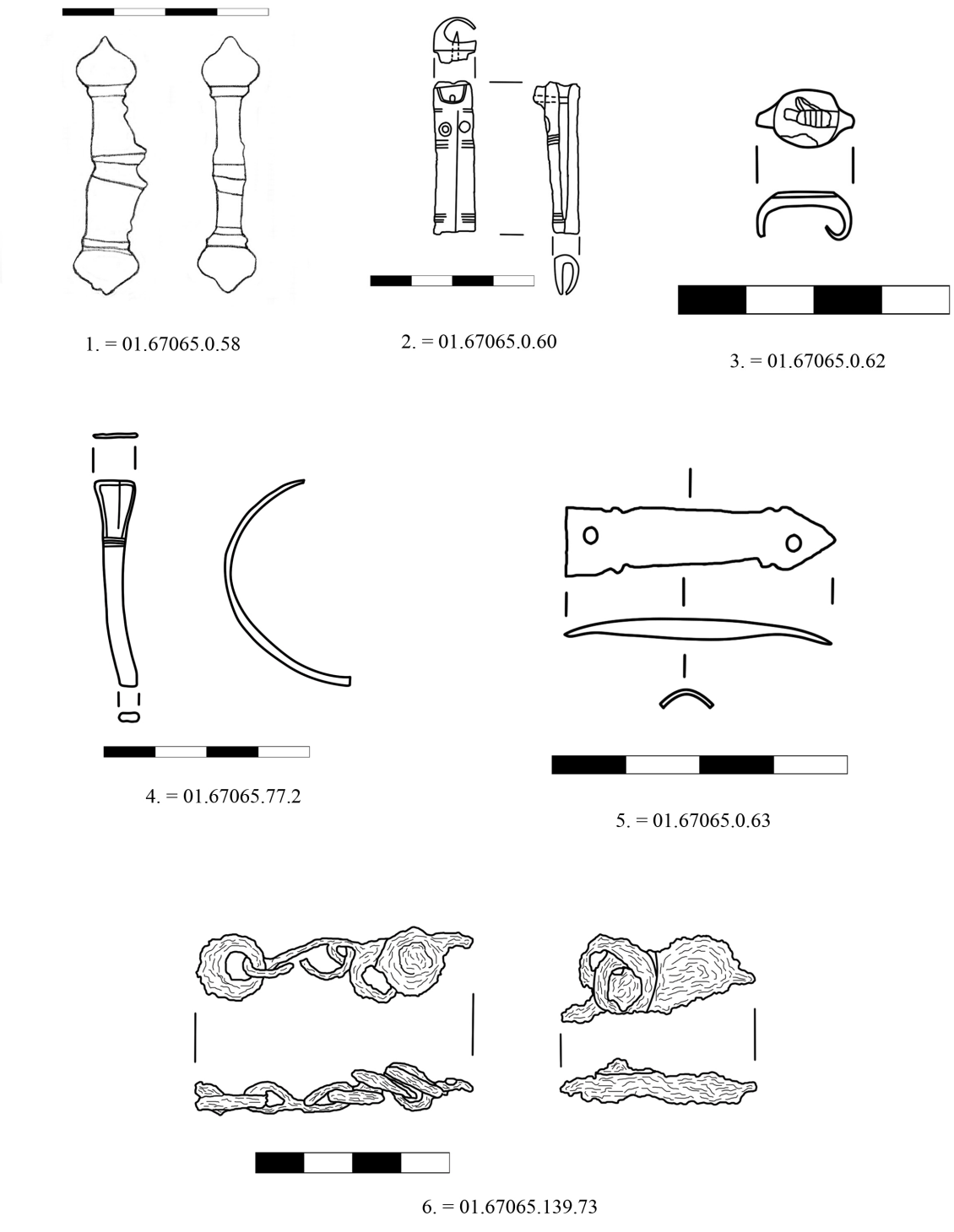

Fig. 17. Brooches (1–2), ring (3), bracelet (4), mounting (5) and chain (6) from the site.

Though the reconstruction of the ring is still quite problematic, a number of analogues to it could be identified. From Pannonia comes a similar ring not only from Budaörs-Kamaraerdő-dűlő,[180] but from Intercisa[181] as well, the latter of which have been dated to the second half of the 4th century AD by Maria R. Alföldi.[182] There is also a known analogue from Augst[183] as well, dated between the end of the 3rd and middle of the 4th centuries AD. These finds show that this ring type was by no means unique to Pannonia, and that the one found at Ács-Kovács-rétek can possibly be dated to somewhere between the end of the 3rd and the third quarter of the 4th centuries AD. Its exact origins are still unknown however, although it is not unlikely that it was made in a workshop somewhere in Pannonia.[184]

Another relatively identifiable, but still very problematic find from the site is a slim, flat shaped, arching bronze item with a cross-section of 4 × 2 millimeters, possibly identifiable as a fragment of a bracelet *(Fig. 17.4)*. One end of the items flattens and widens, with a linear incised decoration applied to it, with banded decoration applied immediately next to the flat part. The other end, however, is broken off, therefore an exact reconstruction of the item is not possible. The only characteristic part of the bracelet is its flattened end, to which only one analogue is known from Roman context from Budaörs, at the end of a *stylus*.[185] Therefore it cannot be ruled out entirely that the item found at Ács-Kovács-rétek is in fact not a bracelet, but a deformed *stylus*. Due to its bad condition however, a more exact identification is not possible at this time.

While there were a number of other bronze items found at the site, none of them could be identified even so well as the aforementioned pieces, although in some cases it is probable that they were clothing appliances. One of these is a 1 millimeter thick, oblong-shaped bronze mounting with a volute-shaped ending on the one side, and a rectangular ending on the other, pierced with holes at each longitudinal ending *(Fig. 17.5)*. The holes probably served as means of fixing the item, but it is still unclear as to what it was affixed to. No exact analogue of it can be found anywhere, only a relatively similar item from Budaörs.[186]

Similarly unclear are two other small bronze mountings that were both flat, slim, and of irregular shape. Both of them had holes through them, but due to their irregular shape, no analogues to them could be found.

Beside the aforementioned bronze items that probably had connections with clothing, there are a few others that were most probably utilitarian in nature. One of these is a small, cone-shaped item with a needle on the flat side, probably belonging to a box. Similarly utilitarian in its use is a small chain-section which contained several very rusty chain-links *(Fig. 17.6)*. Due to its utilitarian shape no analogues could be found, as most chains (for example the one found at Budaörs[187]) were very similar to it. It had no stratigraphic connection to any other artifact as well, and therefore neither its purpose, nor its exact dating can be ascertained.

180 Sey 2012, 585, Fig. 2–4.
181 Alföldi et al. 1957, Taf. LXXVIII.8.
182 Alföldi et al. 1957, 413.
183 Riha 1990, 35, Type No. 8, Variant No. 2, Taf. 8.134–135.
184 Sey 2012, 585.
185 Sey 2012, Fig. 9.4.
186 Sey 2012, Fig. 22.2, 4.
187 Rupnik 2012, Fig. 23.1–6.

No other utilitarian items are known from the site that are made out of bronze. Aside from these, one further bronze item suggests the presence of at least some degree of home industry. The item in question is an amorphous lump of bronze that has been found as scatter. It is yet unclear as to what it was used for exactly. Along with the rest of the bronze artifacts of the site, however, it forms a very interesting part of the find material, which underlines the previously theorized civilian nature of the site, although with a possibility of connection to the military of civilian administration of Pannonia. Also, the dating of all the identifiable items conform to that observed in other parts of the find material as well.

3.2.2.3 Iron objects

A total of nine items made out of iron are known from the settlement. All of them are corroded and in relatively bad condition, which makes their exact identification problematic. This is further complicated by their mainly utilitarian nature, and thus their relatively generalized shaping, which in many cases made their typology, dating, and the determination of their use impossible. Nevertheless they are important parts of the assemblage of the site, giving us information about the everyday lives of the settlement's inhabitants. The iron assemblage itself can be divided into two categories: utility items, and structural items.

The biggest part of the group belongs to the utility items. While their identification is mostly better than average, their exact use is quite problematic to define, since items with exactly the same shape could have been used for many different things.[188]

A relatively well identifiable piece is the widened, flat, slightly arched head-part of a hoe with a socketed ending *(Fig. 18.1)* that most probably belonged to a handpick.[189] Another socked-fragment also known from the site similarly must have belonged to some tool, however, the exact identification of that tool is impossible due to the fragmented nature of the item. Similarly fragmented are the two known knife-blades also known from the site. Given their condition, neither the size of the blade, nor the shape of the hilt can be identified.

Aside from the tools, another group within the iron-made finds of the site are the structural items that probably belonged to some part of a building. One of these is a nail (the only one known from the site) with a rectangular head. This type of nail is relatively common in roman settlements,[190] but their generic shape does not lend any clues to their dating. Since the nail found here came as a scatter find, it is unclear what it was supposed to affix. Its relatively large size however suggests that it was part of a building.

No other structural iron items could be identified even this well. While there are a number of badly corroded fixtures, their exact place or use could not be determined due to their condition. In summary, however, while we see that a number of problems still exist in the iron assemblage of the site, they give us some detail about the settlement itself. The number of agricultural items suggest at least some sort of agricultural production at the site, while the lack of any iron-working tools or half-finished products suggests that no such industry was practiced by the villagers.

188 Rupnik 2012, p. 553.
189 Müller 1982, Fig. 12.
190 Rupnik 2012, p. 575.

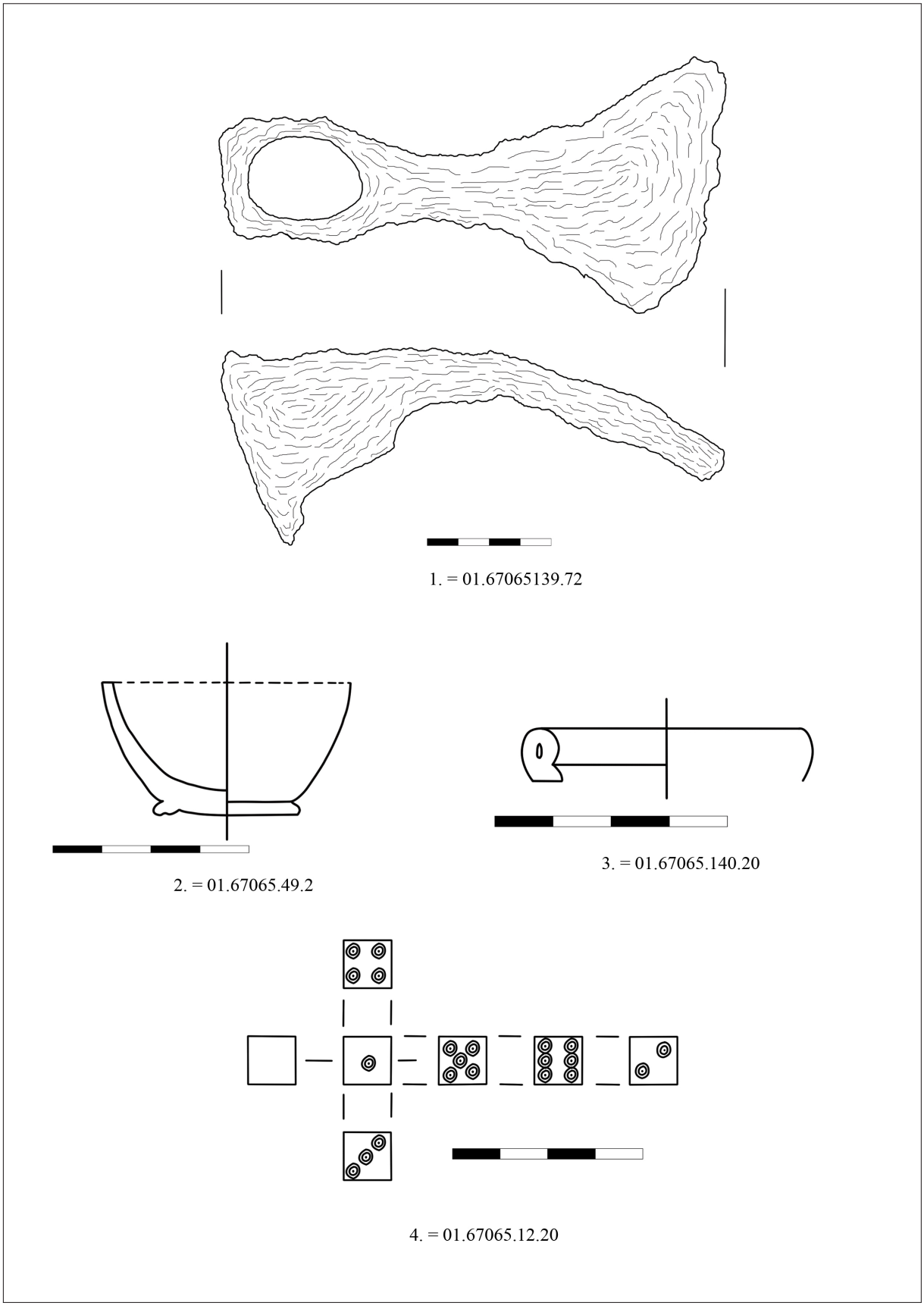

Fig. 18. Iron hoe (1), small glass vessels (2–3) and a dice made of bone (4) from the site.

3.2.3. Glass objects

A total of nine items are known from the site that are made out of glass, every one of them typically Roman. They have relatively various colors, ranging from green to yellow, with some colorless pieces also known. The large degree of irisation and bad condition of these relatively small items made all but two unidentifiable, making in some cases even the exact color of the item hard to identify.

One of the identifiable pieces is a greenish-yellow sherd from the ringed bottom of a small vessel, with some of the vessel's wall still remaining.[191] The thickness of the wall gradually gets thinner, being only 2.5 millimeters thick at the thinnest part. According to its size, it probably belonged to a very small vessel, although the full shape of it cannot be reconstructed. The shape of its base is relatively common in Roman assemblages, being observable on a number of different types of vessels.[192] The exact dating or identification of the sherd is therefore impossible.

The other relatively identifiable fragment is similarly problematic. This item is a yellow-colored, rounded rim fragment.[193] Due to the small size of the fragment, the full shape of the vessel it belonged to cannot be deduced. However, the diameter of the mouth of the vessel could be calculated, which comes to only 5 cm. This suggests that the fragment belonged to a relatively small vessel, probably used for cosmetics purposes.

Apart from the two fragments described above, no other identifiable glass items came to light during the excavation of the site. Sadly, even the identifiable ones cannot tell us more about the chronology of the site. However, the presence of glass, or even cosmetics (as the rim fragment suggests) certainly shows a relatively Romanized population, affirming the evidence from other sources.

3.2.4. Bone objects

Only one item is known from the site that is made out of bone, a small dice *(Fig. 18.4)* that came to light in the southwestern part of the settlement. It has a regular shape, and a size of exactly 1 × 1 × 1 centimeters. Its sides are smooth, and its edges are sharp. The numbering of the sides is similar to that of the dices of today, using various amounts of spots made out of concentric circles, just like other dice known for example from Brigetio.[194] The numbering scheme itself is similar to other contemporary dice, where opposite sides added together always add up to seven. Such dice have been found not only in other parts of the Empire,[195] but also from Germania Libera[196] as well, showing how wide the distribution of these items really is.

While the item in question is very well preserved, its design is very generic. Therefore an exact dating in this case is impossible. Similarly questionable are its origins: while its close analogues from Brigetio imply that it could have been made in a bone workshop there, there is no evidence that could prove this definitely. Still, this tiny item is a great example of everyday items and entertainment[197] at a Roman settlement.

191 See Fig. 18. 2.
192 Barkóczi 1988, Taf. VI.62–68, Taf. XXV.304, Taf.XXXI.344, Taf. LX.522–523.
193 See Fig. 18. 3.
194 See Borhy 2002.
195 Borhy 2003, 174.
196 Schmidt-York 1983, 192., Abb. 1a.
197 For notes on entertainment, see Purcell 1995.

3.3. Conclusions drawn from the analysis of the find material of Ács-Kovács-rétek

The above analyses of the find material reveal many different details about the site of Ács-Kovács-rétek, each of them showing one part of the whole picture. By putting these pieces together, we can draw detailed conclusions about the settlement and its inhabitants.

Several types of finds (like the glazed *mortaria*) show that the population of the settlement was definitely Romanized, having a wide-ranging economic network with a decidedly regional focus, favoring similar goods as we can see in Brigetio. The timeframe of this settlement probably ranges from the second half of the 3rd century AD up until the third quarter of the 4th century AD. Though some of the earliest finds (like Samian wares and imitations of Pompeian red wares) show the probability of the settlement being populated even in the second half of the 3rd century AD, its most active period definitely falls between the end of the 3rd century and the middle of the 4th century AD, as evidenced by most of the pottery assemblage. The coin circulation of the site is also a good evidence of this activity, starting around 313, and being prominent up until the 350s. The fall in the number of coins and the small percentage of burnished pottery (which comes in large quantities in other settlements dating to the end of the 4th century AD),[198] however, shows that this active phase probably lasted only until around the 360s or the 370s. The exact date of the abandonment of the settlement is still unknown, although the decline of coin material and the small amount of coins issued by Valentinian I points towards it being somewhere around the last quarter of the 4th century AD.

Similarly problematic is the determination of the ethnicity of the settlement's inhabitants. It is very probable that they were living a Romanized lifestyle, as evidenced by cook-wares that can be linked to Romanized eating habits (like the glazed *mortaria*), a number of which has been found at the site. Also, the probable use of *tegulae* in the roofs of the houses also points at a Romanized population.

The finds material also shows that the inhabitants had a wide web of economic connections with other parts of the province. Good evidences for this are the different fine ware types that most probably didn't originate from the settlement, as there is no evidence yet that pottery production took place here. While the analogues of these vessels come from all parts of the province, given the fact that almost all of these analogues include finds from Brigetio, it is probable that the main focus of the trade network for the settlement was at this nearby town. It is interesting however that almost no import wares were found at the site, especially since it is located very close to the Danube, and not too far from the trading hub of Brigetio as well. Although this could be explained by the overall fallback in import wares all around Pannonia[199] during the timeframe of the settlement, the complete lack of such items is still puzzling.

As can be seen from the above, after studying the site's find material, we can draw a detailed picture of its former inhabitants. However, as the study of the features previously showed, the settlement underwent at least one rebuilding phase. Therefore if we want to trace the chronology of these changes and establish a more detailed history of the site, we need to combine the information gained from the find material and the features themselves.

198 Ottományi 1996, 117.
199 Gassner 1991, 51.

4. Conclusion: possible interpretations of the settlement of Ács-Kovács-rétek

As it can be seen from the above, the timeframe of the settlement can be determined relatively well, using the data gained from the find material. If we look at the interactions of certain features within the site however, we can see that the settlement underwent some changes even within its roughly 100-year lifespan. At least one, but possibly even more rebuilding periods can be observed according to the interaction of features with each other, but the small number of well dateable finds doesn't allow for us to tell exactly when these took place. It is also hard to tell if rebuilding periods observed at different features coincide with each other, since in many cases there is no physical connection between these features that would tell us more about their chronological order. While these problems hamper our ability to recreate exactly how the settlement changed over time, by studying the features of the site we can still tell a lot about the structure of the settlement.

Although only a small portion of it has been excavated, it can be said that the whole site belonged to one relatively small rural settlement. According to the observed structure of the features, however, the whole area can be divided into two different sections, each representing a functionally different part of the settlement. These have been named Section I and Section II.

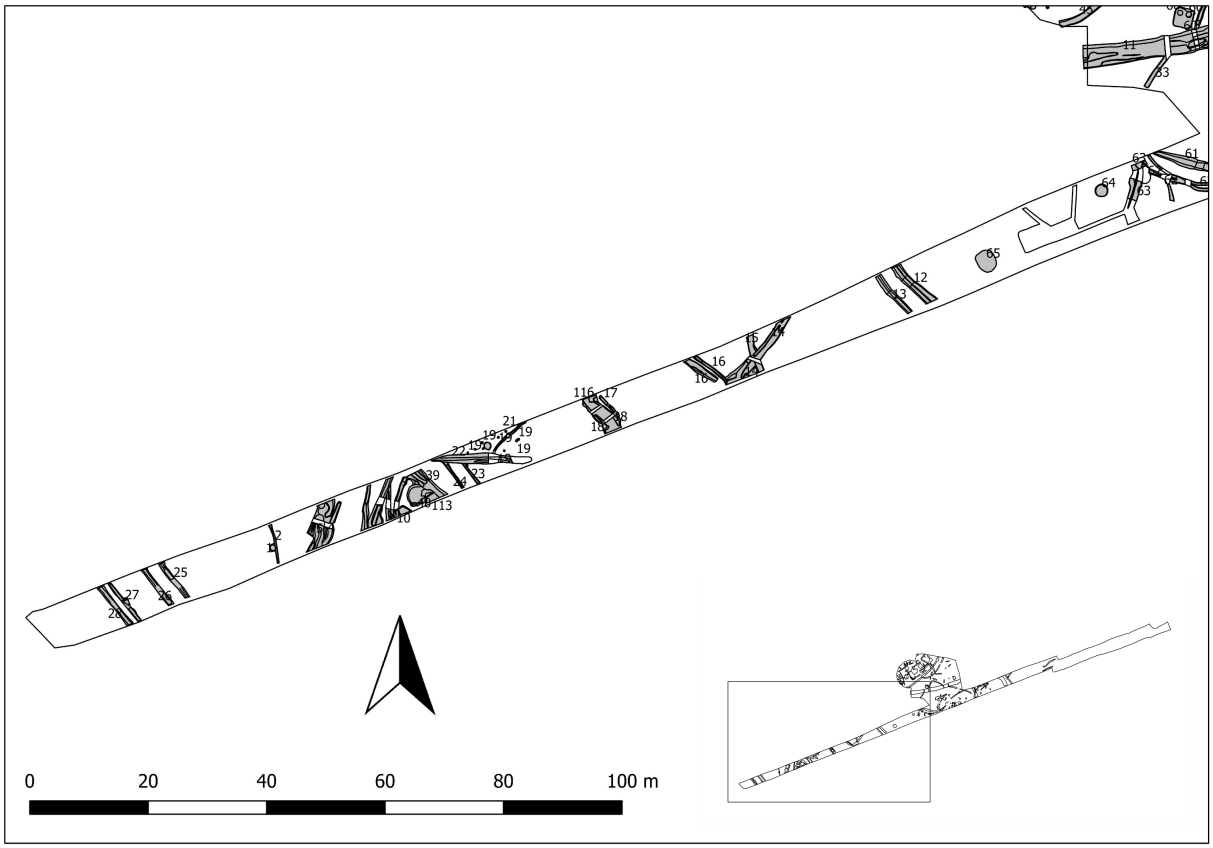

Fig. 19. Sector I, representing the fringes of the settlement in the southwestern part of the site.

Section I represents the southwestern segment of the settlement. Excavation of this area was only possible in a seven meter wide strip, therefore most of the features could only be explored partially. Still, the structure of this segment is visibly different from the settlement's core as

shown by Section II. This part of the site consists mainly of trenches that run mostly in uniform directions, from northwest to southeast. In two cases we can see double trenches close to each other, running parallel. It is unclear as to what the purpose of this area actually was. The sequence of parallel trenches suggests a possible land division function, although since the distance between the trenches varies, it is still unclear what these trenches were the borders of within the settlement. Since no feature has been found southwest of the outermost double trench, it is possible that these trenches signified the border of the settlement. Of course a water-drainage function cannot be ruled out as well.

Interestingly, while Sector I mostly consists of trenches, there are some features in the middle part of it that suggest some degree of habitation. Here a number of postholes and three pits have been found. Some of the postholes form a line, therefore they probably belonged to some structure, but the reconstruction of this structure is currently impossible due to the restraints of the excavation area, which didn't include all the postholes that probably formed the structure. One of the pits (feature No. 113) found only ten meters from this structure could possibly also be identified as a pit house (given its roughly rectangular shape and flat floor), but since most of its extent lay beyond the excavation boundary, this identification still remains questionable.

Most of the finds from Sector I came to light in the possibly inhabited area mentioned above, while most of the other trenches outside of it contained little to no finds. However, the finds in the pits and trenches of the inhabited area are among the earliest from the site: every one of the known Samian wares and Pompeian red ware imitations came from this area, although stratigraphic evidence suggests that they were buried no sooner than the Severan era, probably even later. The stratigraphic evidence also shows that the area in question was rebuilt at least once. This meant that new trenches were dug that did not fit into the system shown by the rest of Sector I, which was not affected by this rebuilding.

In summary, the structure of Sector I shows that except for the small inhabited area this section of the site probably represents the fringes of the settlement, although given the narrow excavation area, the exact settlement structure of this area is still questionable.

To the northeast of the aforementioned Sector I lies Sector II, which contains within its 3200 m^2 of excavated area the core of the known settlement. A large number of pit houses, postholes, pits and trenches were found in this area, forming a complicated web throughout the sector. The stratigraphic evidence, however, shows that there is structure to this area, where at least one rebuilding could be identified that changed the texture of the settlement significantly.

A number of different features are present that form a connected structure. In the northwestern part of the area, both feature No. 96 and 103 are enclosed by trenches that run in almost exactly the same direction as the orientation of the houses themselves. Furthermore, the directional changes of these trenches are roughly perpendicular, which points towards their role being as enclosures. Another set of features can also be observed six meters to the northeast, where trench No. 59 runs parallel to the aforementioned structure. This trench also changes direction perpendicularly, and thus encloses two houses (No. 53 and 83), the orientation of which also conforms to the trench. These structures probably form the earliest period of the settlement, dated probably somewhere around the end of the 3rd century AD. It is also probable that other features also belonged to this period (due to their similar orientation), although given the small

number of dateable finds and the lack of physical connection between the features, the exact determination of these connections is impossible at the moment.

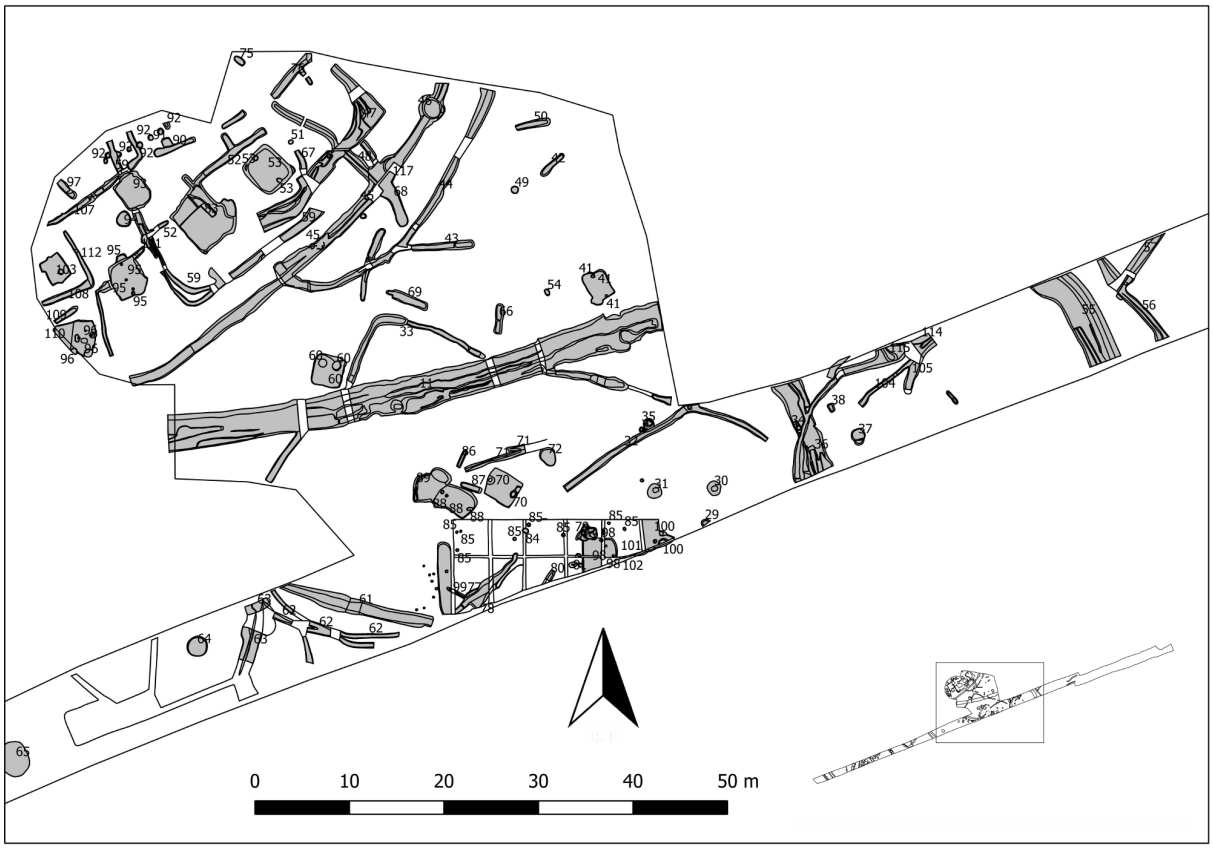

Fig. 20. The core of the settlement, represented by Sector II.

Stratigraphic evidence combined with the find material suggests that the face of the settlement changed somewhere within the first half of the 4th century AD. A number of features built around this time clearly overlap features of the previous period, like pit house No. 93 and 95, and the postholes of structure No. 92. There is also a large trench (No. 47) that overlaps one pit house (No. 83) of the first period, which suggests that it was abandoned around this time. It has to be noted however, that while the stratigraphic data clearly shows that rebuilding took place in the settlement, the resulting features are in many cases not connected physically. Therefore it is impossible to say if they all belonged to one big remodeling, or several smaller ones. Similarly problematic is the dating of these rebuilding periods, although a glazed *mortarium* sherd from the filling of building No. 83 (probably abandoned during the remodeling) suggests that it took place no earlier than the second quarter of the 4th century AD. The find material of other features dating to the second period of the settlement also underline this conclusion.

There is no further evidence that shows rebuilding at the site, although there are a number of superimpositions between features that cannot be dated, and are not connected to any other features. Therefore it is entirely possible that the settlement was rebuilt more than once during its lifetime.

Similarly problematic is the question of when the settlement was abandoned exactly, since there are only sporadic signs of destruction within the site. The most important of these is

a large ashen ruin-layer in the southeastern part of the settlement, underneath which lay a pit house and several postholes. One of these postholes contained a coin issued between 341 and 346, which suggests that the building itself was destroyed sometime after this. It is yet unknown if the fire that caused this ruin-layer destroyed larger parts of the settlement as well, since there is no evidence of burning elsewhere within the site. The coin circulation of the settlement also suggests that it clearly outlived the middle of the 4th century AD. The sharp decline in coin quantity around the time of Valentinian I. however probably means that it did not survive further than the last quarter of the 4th century AD, though it is still unclear what caused its final demise.

While it is clear that many questions still remain unanswered about this settlement, it still signifies a very important step in the understanding of the topography of northern Pannonia. While this area of the surroundings of Brigetio represented an unknown part earlier, we now have signs both here and on other excavated sites like Ács-Ördölkút that even the close hinterlands of the *Ripa Pannonica* were busily occupied in the Late Roman era. To reconstruct the exact structure of this settlement, however, further study and systematic surveys are needed.

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