Using Colors at the Roman Villas of Balaton Upland

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***Abstract* – The ancient Roman villas were cultivation and stock-raising adapted farm units. Some uniformity can be observed in the external appearance of them: the basic criteria is a main building with bath, outbuildings, and also land belonging to them. The biggest known group of villas in Pannonia was at the Balaton Upland. The varied terrain features, the volcanic mountains and the areas rich in streams and raw materials provided the basic conditions of human settlements. The amount of available stone materials at Lake Balaton presented in this article gave the possibility of external and internal decorating (e.g columns, window frames, wall-paintings, moasic floors) of the villas.**

Keywords: Roman villa, geological conditions, architectural decoration, wall-painting, mosaic floor

I. INTRODUCTION. THE ROMANS IN PANNONIA

The Roman legions appeared in the Hungarian Transdanubia at the beginning of the 1st Century A. D.: they developed Pannonia province as a border region from this area, and they organized its independent administration. The so-called Severus-prosperity brought economical boom into the life of the province in the 3rd century, which also led to the high growth of the number of the villas. These manors ensured the food supply of the army: beside its military role Pannonia was also an agricultural hinterland of the Roman Empire, thanks to its favorable natural conditions. The growing barbarous attacks were a permanent risk for the province in the 3-4th century. Despite the military forces Pannonia province was slowly eliminated, however, some villas could serve as residences or houses in the later ages too.

The presence of the Romans in Pannonia caused several changes in the landscape: they wiped out forests, they brought the lands under cultivation, they built villas and towns with channels and paved streets. The Romans were choosing ideal places for buildings according to the proximity of water, the wood-giving forests using for houses and heating, and the Roman road network. They also tried to include a panoramic view, as beautiful as possible, into the scene [1].

The buildings of the ancient Roman era were purposeful, the settlements and houses of the provinces were built in the same types to the buildings of the center of Empire. Schematization can be found even in Roman homes: houses of the same types were built, which could be transformed according to the local climate [2], [3], [4], [5], [6], [7], [8]. The main types of houses were taken over for construction of villas as well (the residences of the indigenous people could have only slightly influence to the structures of Roman villas adapted in Pannonia).

The word *villa* does not mean holiday house in the modern sense, it was originally a farming or crafting unit producing for self-sufficiency or for the local market. Uniformity can be observed in the construction of villas, which basic criterion are: a residential house with a bathroom or an independent bath building (so-called *pars urbana*), outbuildings (e.g., barns, stables, sheds; so-called *pars rustica*, *pars fructuaria*) and gardens (vegetable garden, orchards and flower gardens). Fields and cemeteries also belonged to the villas [1], [2], [6], [8], [9], [10].

The centers of the farms were usually enclosed with wooden or stone walls, but primarily they were not built for defensive purposes: these walls were built as fences to indicate the boundaries of the manor, separating the fields and pastures from the *pars urbana* and *rustica*, to hold the crops, tools and animals in the central yard. All of these functions were separated by additional walls, separating them from each other and insure the peace of the villa owners [1], [10], [11]. The above mentioned estate was lying beyond this bounded area. The remains of the fences were found at some Pannonian villas (e.g. at Nemesvámos-Baláca puszta, Bruckneudorf).

Villas are considered as the richest building group of Roman architecture in Hungary, however, most of the identified villas lies outside of the borders of nowadays. Approximately six hundred villas are known in Pannonia so far: more than four hundred of them are localized in Hungary, and almost hundred of them are located on the Balaton Upland and in Hill Bakony (including the surroundings of Pápa). However these qunatities can not be considered complete due the small scale of archaeological excavations and the wooden building material of the earliest villas [3], [6]. Five large groups of villas can be separated in Pannonia province (Figure 1): 1) the villas of Hill Mecsek, 2) the villas around the city of Aquincum (today Budapest, Óbuda), 3) the villas in the Drava-Sava basin (today in Croatia and Slovenia; this part became a major area especially in the Late Roman times, thanks also to the closeness of imperial center Sirmium), 4) the villas around the Lake Fertő (most of them are in Burgenland, Austria today, such as the villas of Deutschkreutz and Eisenstadt; it was a very important area thanks to the so-called Amber Road and

the limes road running by the River Danube), and 5) the biggest known group of villas were at the Balaton Upland [2], [6], [8], [11].

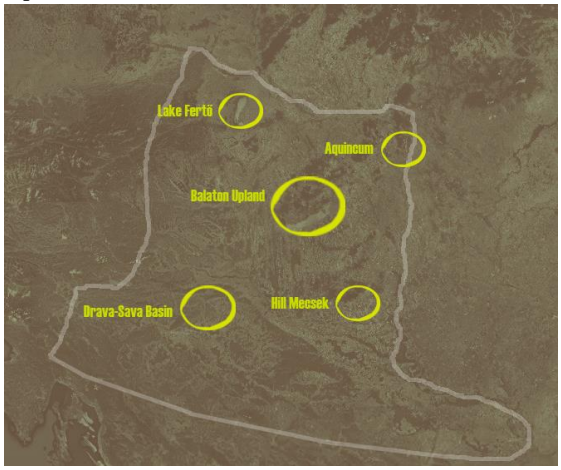

Figure 1. The main groups of the Roman villas in Pannonia (illustration by the authors)

The popularity of the Balaton region should be explained by the similarity of this countryside to the Italian landscape, and two major roads were running parallel close to the northern shore of the Lake Balaton [2], [12].

II. THE VILLA BUILDINGS OF PANNONIA

Because the villa as an agricultural unit can not be determined architecturally, the archeologists sorted them based on the floor plan type of the main building (*pars urbana*) [2], [6], [7], [8].

However, this method is not suitable for periodization, because the main types were formed for the time of establishing Pannonia province in the 1st Century A.D. Therefore, the types of main buildings could be freely changed depending on the locations and the financial and social situations of the owners. In addition, it was possible to take advantage of the available place due to the freestanding situation of farm units, so some individual solutions could also be created.

Two main types can be distinguished by the floor plan of main residential buildings, although these types appeared clearly rarely: 1) the *porticus villas*, and 2) villas with central patio (Figure 2) [2], [6], [8], [10], [13], [14]. However, there are only a few known, excavated villas on the Balaton Upland, dominant or special types can not revealed in their floor plans [2].

The *porticus villas* (*linear* or so-called *row-type* villas, where a *porticus* or corridor connected to the main facade) appeared less often in Pannonia (e.g. in Örvényes). Their feature was a *porticus* surrounded by two wings running along on the longer entrance side of the house with transverse axis. The fashion of *porticus villas* were dominant in the 3rd-4th Century A.D., keeping partly defense aspects in mind. The rooms of this villa-type were organized in a linear order, and they had usually smaller areas. However these buildings were often restructured to the other villa type (see below, e.g. in Veszprém-Gyulafirátót).

Most of the Pannonian villas can be classified into the other type of villas (the so-called *Hall-type* or *Zentralhof-typ*), where the rooms were organized around an *atrium* or *peristylium*, which was a supposedly uncovered central patio. Therefore, the space requirement of this type was much bigger than a linear type villa. These buildings had a reasonable floor plan (the entrance usually opened on the longer side, e.g. at Baláca) and they had demanding interior decorations, mosaics and wall-paintings. This villa-type was mostly dominant in the 1st-2nd Century A.D.: already the earliest houses were built on Italian style. However, some transformations were needed because of the slightly cooler and windy Pannonian climate (e.g. with building more heated rooms, or walling one side of the peristylium in Baláca).

We can conclude the size of the land from the size of the main building, which has changed based on the floor plan-type [7], [8], [15], because fields belonged to the *villas* in its original meaning, even so closely that a parcel could have the name *fundus* only in the case when a villa stood on it. The quantity and quality of buildings, the size of the main buildings, the fenced courtyard can certainly refer to the size of the estates, because it was a requirement by the ancient Roman authors, that the size of the villa has to be in corresponding rate with the extension of the surrounding fundus. According to this, there were large-sized estates over 125 hectares (e.g. Baláca), medium-sized (20-125 acres) estates, which were generally on the Balaton Upland, e.g. at Szentkirályszabadja, Örvényes), and also small-sized estates. The biggest villas had approximately four hectares (or more)-sized enclosed center (e.g. the size of center of Baláca was nine hectares), with a nearly 1000-1200 m^2 main building and a separate baths, and the outbuildings were mainly along the courtyard wall. The villa-type with *peristylium* appeared primarily at this magnitude. The center of smaller villas (primarily *porticus villas*) was about one hectare, with a smaller main house of 150-500 m^2, the bath room was mostly included in it.

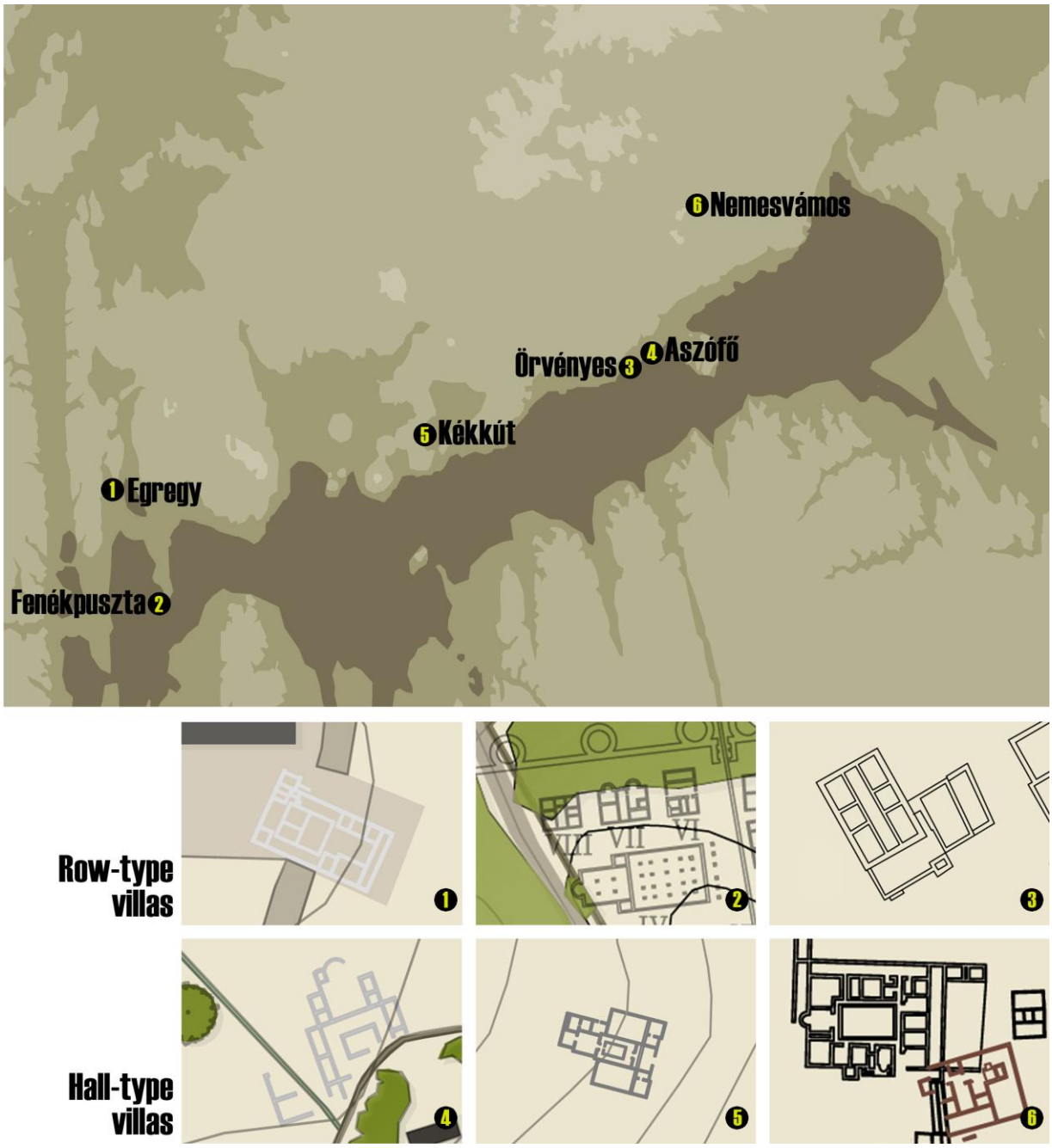

Figure 2. The floor plan classification of the main buildings of villas around the Lake Balaton (illustration by the authors)

III. GEOLOGICAL CONDITIONS OF THE BALATON UPLAND. ECONOMIC ENVIRONMENT

The varied terrain conditions of the Balaton Upland, the volcanic mountains and basins, the nice climate, the areas rich in water sources and raw materials, the fertile lands provided the basic conditions for human settling. Thus this area was particularly suitable for building villas and other rural settlements.

A. The architectural decorative elements of the villas

The large amount of available stone materials gave the possibility of larger construction works. The stone was the main building material of villas around Lake Balaton, and partly brick and wood [6]. The material tests have shown that the rocks used as building material were quarried locally (Figure 3):

- The region of Balaton Upland and Hill Bakony is very varied from a geological point of view: materials ideal for building,

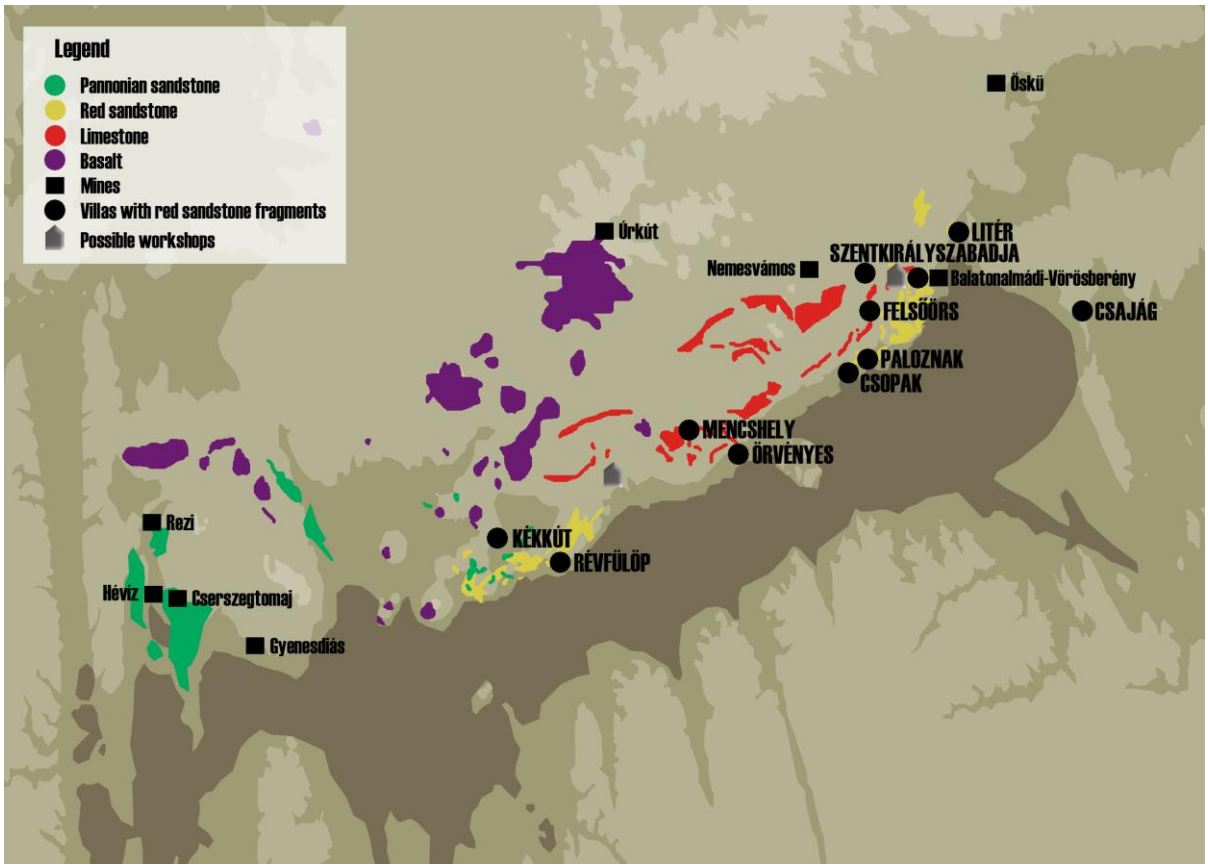

Figure 3. The most important sites of mining and the use of rocks and minerals at the Roman villas (based on Firnigl 2012, Kiss 1960 and Vajda 2013)

carving and decorating are in some areas (e.g. sandstone, or limestone, the most common material here, which is excellent for building works), and harder rocks are for the other areas (e.g. the dolomite of Keszthelyi Mountain is suitable for road construction works). Pannonian sandstones can be found in significant quantities in the western periphery of Transdanubian Mountain, and basalt is frequent at Tátika-mountain, in Tapolca Basin and in Káli Basin [16].

- As well as the basalt, red sandstone also plays a decisive role in the building works of Balaton Upland also nowadays. The red sandtone has high quartz content, thus its material is hard, durable and suitable for rough carvings. This rock lies near to the surface between Badacsonytomaj and Zánka, and also between Balatonfüred and Balatonalmádi. Its main mining places are Vörösberény and the Hill Bakony. The decorative elements (such as the decorative columns on patios, corridors, peristyles, the doorways and window frames) were usually carved from red sandstone in the Roman era. Therefore, these decorations could be a part of the general image of Roman villas of the 2nd-3rd century A.D. [16], [17], [18], [19], [20]. These kinds of ornamental elements were excavated among others at the villas of Nemesvámos-Baláca puszta, Balatonalmádi, Csopak, Paloznak, Örvényes, Kékkút, Mencshely and Szentkirályszabadja (Figure 4). The remained column-capitals had a special design, which is not known in other parts of Pannonia or in the surrounding provinces: local stone carving workshops could be found at Balatonalmád-Vörösberény and between Kékkút and Mencshely.

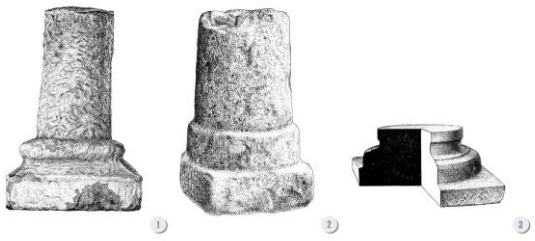

Figure 4. Architectural elements of the villas: 1-2) red sandstone column fragments from the villas of Szentkirályszabadja-Szobahely and Kékkút-Savanyúkúti-dűlő, 3) limestone plinth and torus from Kékkút (based on Éri et al. 1969, p. 190., Sági 1972, p. 124.)

- Mainly dolomite and solid limestone are characteristic of the mountain ranges of Northern and Southern Bakony (e.g. the area of Balatonszőlős-Dörgicse-Nagyvázsony). The prevailing rocks at Nemesvámos are also of the dolomite and solid limestone type, which are good building materials. [21], [22].

- Sandstone occurs at the foot of Keszthelyi Mountain, at Rezi and Cserszegtomaj: this material is good for carving, and it could be quarried in blocks [16]. The Roman fortress of Fenékpuszta was derived from the surrounding area of Rezi, Cserszegtomaj, Gyenediás and Hévíz. The ancient quarry of Öskü-Bántapuszta produced white sandstone (Figure 4) [19], [22].
- At the same time the noble stones such as granite and marble were import materials.

Although an important road between Savaria (today Szombathely), Arrabona (Győr) and Aquincum (Budapest-Óbuda) was running close to Pápa, no fortress nor city was built here. However the arcaheologist localized several Roman settlements in the adminsitrative area of today's Pápa and in its neighborhood [1], [23]: three villas, six other rural settlements and a cemetery were identified in a cca. 5 km radius circle from downtown (Figure 5).

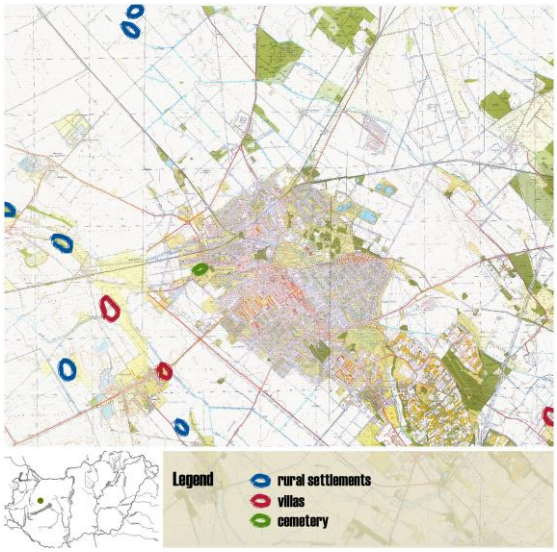

Figure 5. The types of Roman sites around Pápa (within a 5 km of radius of the downtown of nowadays)

At the same time almost 40 places are identified in a 10 km radius circle (most of them were villas and other rural settlements), typically in high altitudes and close to water sources. The geological conditions, the surrounding stone materials (e.g. the limestone of Hill Bakony, as well as the clay and sand of plains) provided an adequate basis for construction works and decorating the buildings.

B. The interior decoration of the villas

The local rocks were used not only for the external decoration of villas, but they were suitable for plastering the buildings, as well as decorating the rooms with wall-paintings and mosaic floors. The Romans used the Greek plastering and wall-painting techniques. Before the Romans painted a wall, it was perfectly smooth plastered in several layers: the Romans used dolomite flour mixed with slaked lime and rubbed on the wall to get the smooth surface of the intern walls. Several fragments of wall-paintings of Baláca shows that the paints were applied on a snow-white smoothing plaster (*intonaco*): the lime milk leaked to the surface when rubbing this plaster, and its white color served as an excellent basis for colored motifs. The dominant basic colors throughout the Roman Empire were: ocher, blue, green, black, and Pompeian red (its composition is not exactly known yet), and the shades were made from mixing these colors (Figure 6) Lime milk (its vaterite-content) was often used for stabilizing the painting materials. The finished wall-paintings were often fitted with a glossy coating made from so-called Punic wax (*encaustum*).

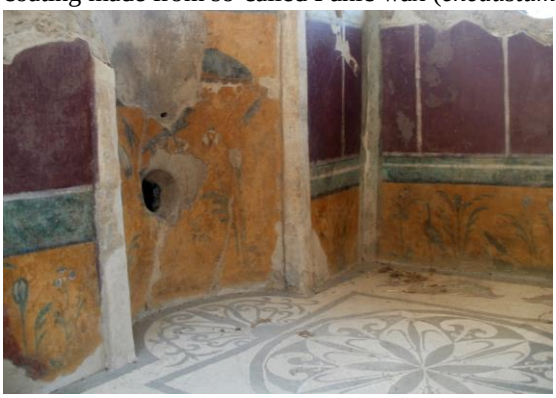

Figure 6. The dominant wall-painting colors and motifs (Casa di Paquius Proculus, Pompeii; photo by the authors)

Many of the rooms of the main building of the well-researched villa at Baláca were decorated with wall-paintings with plant motifs. The remained fragments are following the Pompeian style: the wall-paintings of Pompeii are traditionally divided into four groups based on their motifs (they imitate marble walls, or they want to enlarge the space with perspective tools, and they are decorated with architectural ornaments or landscapes) [8], [24], [25], [26], [27], [28].

Most of the wall-paintings of Baláca were made with genuine fresco technology, so the colors were applied even on the wet base. The decoration of the main building changed from one period to another: the earliest wall-paintings (on yellow-purple, red and black base) showing the spread of Roman culture were also on agricultural farms [24], [29], [30]. The colorants of these wall-painting fragments had detailed mineral examination.

Wall-painting fragments remained also from the early period of the main building, which are the witnesses of a blooming estate of the 1st-2nd Century A.D. The *in-situ* fragments on white colored base with red frames, simple motifs and flowers are the latest vestiges of the villa [18]. The interglacial period of nowadays, the so-called Beech II. era exists for 2800 years: this fact proves that the fine interior-decorations and motifs were made mostly after Italian design [31]. The most important motifs and colors are mentioned below (Figure 7):

- The so-called *red dining room* was a room in the main building No. I., or it was the part of the old main building No. XIII., which was already demolished by the Romans. Its wall-paintings were made on a Pompeian red base, representing the deliacies of the Roman era (e.g. the details of egg, quail, bread, mushroom). The boards with red surfaces were divided with *candelabra* decorated with *dionysic* masks, birds and vines. The footing of wall-painting had a black-colored base, with a small lake, aquatic birds, ducks and a rooster. The figural zone had three main parts: with aquatic (dolphins), coastal (herons between reed and sedge) and land (a hunting scene with deer, hounds, horses and hunters) scenes. The decorations are close to the wall-paintings of Pompeji and Herculaneum [2], [28], [32].
- The *red-black room* (or *room with candelabra*) was decorated with red panels and *candelabra* between the panels. The *candelabra* had a black-colored base, decorated with floral and circular ornaments in yellow, green and white colors. The wall-painting footing, which was decorated with waterbirds and sedge, was separated from the panels with a green stripe. This wall-painting was made definitely at the turn of the 1st-2nd Century A.D., in the early period of the villa. Thus this room belonged not to the building No. I., rather to the early main building No. XIII. (like among others the red dining room) [2], [26], [28].
- The so-called *yellow-purple room* was the room No. 9 in the main building No. I, or it was also the part of the old main building No. XIII. Its wall-painting could be made in the early period of the villa, following Pompeian style. Mythological figures were painted in the middle of it with stylized flowers framed yellow panels. The purple-colored footing represented a water scene with green sedge and seed, where ducks, geese and pigeons can be seen. The yellow and purple base colors are separated with white and green stripes [2], [28], [30], [33].
- The wall-paintings of the *black room* were made at the end of the 1st century A.D., in the early period of the main building (as the part

Figure 7. The main colors of wall-paintings, on the example of the villa at Baláca (based on Kirchhof 2002, Kirchhof 2005, Palágyi 1995 and the photos by the authors)

of building No. XIII.). Only a few fragments remained: the base colors were black and purplish red, separated with white stripes, and its decorative motifs were the child Dionysus with a grape in his hand, as well as animal heads and mask belonging to the *dionysic circle* [2], [28].

- The white (light purple) based wall-painting of the *room with a harvest scene* was made less carefully in the first half of the 2nd Century A.D. This wall-painting on which the yellow color and its tones were dominating was the decoration of the barrel-vaulted ceiling of the room No. 31. in the main building No. I., or rather it was the part of the old main building No. XIII. The wall-painting had rough figures in cassettes (trellis) with red, yellow and grey frames: e.g. an old man in toga with lion, with blue-red-brown-green colors painted peacocks, and in a vine-grove harvesting slaves (the *pergula* was installed by the Romans in Pannonia). The panther and lion figures are the part of the *dionysic circle* (see *red dining room* and *black room* as well) [2], [8], [24], [28], [34], [35], [36].
- In the 3rd century walled side of the peristylium (see Introduction) was painted with a garden scene, with birds, fence and blossoming pomegranate trees as well as olive trees behind it. The decoration was divided with half-columns to eight parts. The relative of this wall-painting was on the outer wall of builiding No. X. (it was possibly a house for the personnels) [18], [31], [37], [38], [39].

The materials of several fragments were analyzed by examining the wall-paintings of Baláca [24]:

- according to this, one of the red-colored fragments, and the purplish red color of the *yellow-purple room* contained bauxite. The closest place to find bauxite is Vörösberény (the presence of the bauxite is frequent on the dolomite along Lake Balaton). Bauxite rich in iron is bright red in powdered form. The bauxite mixed with hematite gave the purplish red color. The bauxite mixed with hematite and boehmite gave the cherry-red color of the *red dining room*. The light purple-pink material also came from bauxite sites (it refers to the presence of ferrihaloisite: its mining location is unknown, it came from the Hill Bakony, instead of Vörösberény).
- The Romans won yellow and ocher-colored paint from gray or gray-blue and yellow clay, which are often in Transdanubia. The color of these goethite-contained clays is constant in calcareous, basic environment. The lively, almost lemon yellow-colored fragment from the red dining room was achieved from yellow clay mixed with auripigment.
- The Romans achieved brownish color from mixing yellow clay with red bauxite.
- The green minerals for creating green-colored paint were found in great quantities at Úrkút (chlorothio-glauconite material) and in Bakonybél (glauconite material).
- The lime milk mentioned above gave the white color of smoothing plaster made from slaked lime and dolomite flour. The decorative motifs (e.g. the stripes between the colored wall-fields) were painted with lead white, which was known and made already in the Roman era. Kaolin (white clay) was also identified on one of the fragments from the *room with harvest scene*.
- The black fragment confirmed the presence of dolomite, quartz and soot instead of black-colored minerals (e.g. pyroluzite, magnetite).

Also the mosaic floors were important decorative elements of the villas beside the wall-paintings. Mosaic floors with geometric patterns came into the light from four rooms of the main building in Baláca, which were made probably by a Northern Italian master in the turn of the 2nd-3rd Century A.D. The geometric patternd mosaic floor of the room No. 8. was framed by amber-leafed motifs [40]. The mosaic floors of room No. 20. and No. 31. contained figurative motifs as well (e.g. two peasants sitting on the branch of a pomegranate tree in the latter room), these moasics are one of the finest pieces of Pannonian mosaic art [8], [18], [31], [41], [42]. Also the mosaic floors were made from local rocks [41].

IV. RESULTS

The demand of decoration and coziness were the part of rural architecture beside the principle of utility written by the ancient authors. The area around the Lake Balaton and Hill Bakony provided an excellent basis and stone materials for adopting the Italian construction methods and external-internal decoration styles (primarily according to sample books). It created colorful, cozy main buildings and baths.

The most important building materials were the limestone and basalt in this area, the decorative architectural elements were often carved from red sandstone. The basic colors of wall-paintings were widespread in the Roman Empire: the raw materials of them in the middle of Pannonia were mainly the bauxite, gray and yellow clay, lead white, as well as the soot best shown at the villa of Nemesvámos-Baláca puszta. The use of colors as well as the motifs refer to using sample books (e.g. the wall-painting footing with *candelabra* and water birds motifs were fashionable in the provinces at the turn of 1st-2nd Century A.D.).

The early wall-paintings of Baláca (e.g. at the *red-black room*) created a liveable environment with the rhythm of compositions and the harmony of the overall effect, the tools of which were dividing the horizontal and vertical motifs, the contrasts of the applied colors, and the alternation of richly decorated and undecorated surfaces.

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