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## WOODEN ARCHITECTURE: COMBINING DIFFERENT TECHNIQUES

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**T**he paper discusses particular techniques of building wooden houses, which combine long construction elements and wattle and daub, based on the evidence from the Balkans and Central Europe, using analogies from other parts of the world from the Early Iron Age. The discussion is based on ground plans, impressions in the daub and archaeological evidence.

**Ključne riječi:** wooden houses, construction elements, Balkans, Central Europe

Already during my young years when I worked in the Prague City Museum and in the Most Archaeological Institute I tried to study the daub from various wattle-and-daub constructions in prehistoric and early historic settlements. When excavating Bronze and Iron Age sites I often found examples of imprints which were not only of wattle, but also of wooden planks or posts, some of them well preserved. There were also fragments with

imprints which documented some small construction details, perhaps framing. But only much later, when I was able to study comparable constructions also in living building technique in the Near East countries and in Sri Lanka, and after studying more numerous and better conserved fragments of burned daub from my excavations in Bulgaria I started to understand that different ways of daub imprints with different imprints could well come

Fig. 1-2. Biskupim, modern reconstruction of log houses (construction "sumikowa", i.e. the horizontal planks are inserted in the vertical posts). Photo with permission of Museum Biskupim.



Fig. 2-4. Fragments of wattle with imprints of daub and planks and beams, Vetren-Pistiros, Bulgaria, 5th - 4th century B.C.



from the same constructions. Even more so opened me the eyes the study of folk traditional architecture in the Balkans, in Bulgaria, Macedonia and elsewhere. The publication of some Late Bronze Age sites in Bohemia were another impetus for studying in more detail the less known techniques used for many houses of Late Bronze and Iron Age in my country; some of them I tried already to discuss elsewhere (Bouzek 2008, 2009). M. Kuna found similar well preserved daub with imprints at Roztoky and with several colleagues offered similar interpretation of them (Haller - Gentizon - Kuna 2007; cf. also Ernée 2005). For the construction technique similar with timber framing only several supporting posts were necessary in the corners, similarly as with some log houses with "sumikowa" technique, well known from Biskupim and similar sites in Poland (Baranowski - Zajšczkowski 1995; Piotrowski - Zajšczkowski 1991 - Figs. 1-2). But houses with timber framing and wattle-and daub panels supplementing the frame ("Fachwerk") much less timber was necessary than for Biskupin-type buildings and they were used with success in areas with less frequent forests. The well preserved fragments of daub imprints from our excavations at Vetren - Pistiros and parallels in 19th century folk architecture in Bulgaria give more informative hints to understanding of the details of this kind of constructions (Bouzek 2006a, 2008). Even in

Central Europe there are already more traces of door and window framings known, as well as of inner arrangements on the walls (Bouzek 2006b).

Another constructions are now well known from excavations of V. Vokolek in Eastern Bohemia. The combination of framing with wattle-and-daub needed some fixing in places, marked by a few post holes, but the reconstruction based on the posts would be misleading; the preserved floors show very different shape of ground plans than what would be marked by the post-holes, which were only of arbitrary importance for the basic construction (for several excavations by V. Vokolek see in Venclová, ed. 2008, 84, fig. 44). The Early Iron Age parallels from Bavaria (Berg-Hobom and Zuber in print) and Upper Austria (Trebsche in print) show mainly log-houses, the Final Bronze Age (Late Urnfields) buildings mainly post-houses (Zuber im Druck), as well as in Bohemia and





Moravia (Říhový 1982ab); the “Fachwerk“ buildings were certainly not the only type used during the Late Bronze and Early Iron Ages (cf. also Dšbrowski, ed. 1981; Vokolek 2001; Berg-Hobom in print).

Some examples from Pistiros and from the folk architecture in Bulgaria are illustrated here. The best preserved remains of combining imprints of beams, planks and wattle from Pistiros near Vetren in Bulgaria are typical for such combined constructions (figs. 3 and 4); they include parts of frames of doors and windows, and fragments of painted walls in white, grey, yellow and red colours (cf. Bouzek-Musil 2007). Parallels between remains of constructions in the Balkans and in Central Europe attest that this art of constructing houses was generally used on large parts of Europe. 19<sup>th</sup> century folk architecture in Bulgaria was not much different from that of later prehistory and Classical Antiquity (Figs. 5-6).

As concerns the timber post constructions of Neolithic houses many specialists believe that they decayed in ten to fifteen years and had to be replaced very often (so Bylany Seminar 1990), but the ethnographic parallels from many parts of the world show that such huts were used by one family from marriage to death. Buildings for sacrificial use could be used much longer, if well kept and repaired. Some small ‘temples’ or priest houses in Anuradhapura, Sri Landa, were still in good state after 150 years; they



Fig. 5-6. “Fachwerk” houses with wattle-and daub panels in eastern Bulgaria, late 19th century. The first decaying, the second well kept.

were built still in Kandyan times, i.e. before the British annexation of central Ceylon.

Other specialists let prehistoric populations work very hard - ten to twelve hours per day, while other came to conclusion that construction of one house could be accomplished by the married pair only during the whole season between spring and fall. For ex. J. Ostoj-Zagórski in some calculations on Biskupin fort (Henneberg - Ostoj-Zagórski 1977; Ostoj-Zagórski 1982, 1983) let the inhabitants work much harder than it in 19th century capitalist industry before some limits against labour force exploitation were set, and I. Pleinerová (Pleinerová - Hrala 1988, 162-164) counted that construction of one family house deserved for one married couple more than six months of intensive work

If we look after ethnographic parallels the building of a house is usually the task of the whole village. In Ceylon the present author saw the construction of a family house by his own eyes. On the first day men from the village brought by cart mud from the pond, on the second timber from the jungle, on third day they constructed the framework of posts combined with wattle, on the fourth they put the daub plaster from the outside and the inside. On the fifth day the plastering was finished and the floor of hard clay was added. On the sixth day walls were painted and the roof of palm leaves was put on the house, which was in the previous days prepared by women of the village. On the seventh day two sacks of cement were brought and the floor plastered; it was believed to be especially good protection against the snakes. In any case the whole house was finished and made ready for use for the new couple within one week (fig. 7). The well built log houses hold much longer and I saw in the neighbourhood of Moscow mid 19th century cabins still well inhabitable, similarly as early 19<sup>th</sup> century pre-earthquake houses in California, even if not rarely with sloping floors. Log houses were also usually repaired in my country by replacing the lowest beams which were partly rotten; I helped to do

Fig. 7. Anuradhapura, Sri Lanka, modern post house with wattle-and daub construction, plastered. Photos author.



this work still myself in the fifties of the last century. Such houses were normally used for more subsequent generations, but much depended of the quality of work. It must be admitted that in Late Bronze and Early Iron Age the level of carpenter work was not always on the same level (cf. Baranowski - Zajšckowski 1995; Piotrowski - Zajšczkowski 1991; Jaksanis, ed. 1991). For ex. my friend D. Koutecký found in British Columbia the thirty year ago abandoned log houses of the Haida tribe in rather good state of preservation, if the roof was all right. Without good roof any house decays; I could see this clearly in the small villages abandoned by the Turks in southern Cyprus during the civil war; not repaired houses were in ruins, those with some maintenance in good state of preservation (cf. Bouzek - Koutecký - Kruta 1991ab).. Archaeological traces of “Fachwerk” and log houses in the terrain are mainly only shallow irregular oblong pits with traces of fireplace or herd. These traces discussed in detail elsewhere, while publishing the Chabařovice

site ( Bouzek-Koutecký-Kruta 1991), have many parallels elsewhere, from South Bohemia for ex. in Bechyně II, Radčice I A und Hluboká nad Vltavou II (Chvojka 2009, 128 fig. 18, 130 fig. 20 , 138 fig. 24).

Thanks to a UNESCO grant my Bulgarian colleague Emilia Ivanova could analyze in the UNESCO laboratory in Firenze traces of paint on daub fragments from Pistiros and find out that various kinds of ochre were used: the usual colours were red, white, yellow and bluish grey. Lime was also frequently employed. Her results have not yet been published, but she kindly allowed me to use them for this paper. I myself found nearly identical traces of colours on daub from Bohemia, so it seems that painted walls were widely used. But there are hints that wall carpets were also widely used, and floor carpets as well. The small several meters long narrow ditches with loom-weights could well have been foundations of looms for carpets (Bouzek 2006b). The interiors of prehistoric houses were not as dull as they are in our usual reconstructions.

This all should teach us that even in prehistoric times the talent for inventions of ancient people was of considerable level; their talents could find solutions based on natural resources of any specific country, The inventions started in prehistoric Europe already with the first agriculturalists. The agriculture was introduced to the Balkans and Central Europe from the Eastern Mediterranean, but the Neolithic wooden architecture was an invention of the genius of European people. Such inventiveness continued also in later prehistory, it could use the possibilities of environment, climatic conditions and natural resources for constructions of living houses, fortifications and religious buildings, of which already the circular ditches of Linear Pottery culture *rondels* are fascinating enough, and in Bronze Age in northern Croatia notably the *castellieri*, of which the best examples are known in the area in which this conference was held (Hänsel 1997).

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## SAŽETAK

### **DRVENA ARHITEKTURA, KOMBINIRANJE RAZLIČITIH TEHNIKA**

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*Ovaj znanstveni rad govori o specifičnim tehnikama izgradnje drvenih kuća koje kombiniraju dugačke konstruktivne elemente i kućni maz, na temelju dokaza s Balkanskog poluotoka i iz Srednje Europe, uz korištenje*

*analogija iz drugih dijelova svijeta iz ranog željeznog doba. Rasprava se temelji na tlocrtima, otiscima u glini i nalazima.*