5_2_2_1_Houses_B17_and_B18,_adjacent_pits_and_linear_pit,_with_micromorphology (Burdo & Videiko 2016)

The 2009 geophysical plot revealed part of the inner and outer house circuits which lay close to the mega-structure excavated in 2012 (Quarter A). The Ukrainian side chose to excavate two adjoining houses (B17 and B18) which lay closest to the mega-structure, as well as investigating the supposedly associated house pits for each house. One complete burnt house was excavated (House B17) (ADS LINK TO 5_2_2_2_1_HOUSE_B17_PHOTOS/B17_general), as well as part of a second house (House B18) (ADS LINK TO 5_2_2_2_2_HOUSE_B18_PHOTOS/B18). The shapes of the houses corresponded to the shape of the anomalies on the geophysical plot. The dimensions of House B17 were 24 m in length by 8 to 12 m in width. Most of the area of the house was covered in destruction daub to a depth of over 0.30m (viz., the classic 'ploschadka'. A possible threshold was identified in the West side (ADS LINK TO 5_2_2_2_1_HOUSE_B17_PHOTOS/B17_P14_possible_theshold). Several abrupt changes in the slope of the burnt daub suggested the existence of pits or hollows under the daub layer; however, this did not turn out to be the case. Instead, the form of burnt daub was probably connected to the form of house destruction. One example was noted of two sections of wall overlying each other - perhaps a sign of a two-storey building (ADS LINK TO 5_2_2_2_1_HOUSE_B17_PHOTOS/ B17_H14_wall_overlay).

Interior details from House B-17 show incised and red-painted decoration; in particular, near the edge of the house, plaster fragments were found to have painted decoration. Under the daub were three raised areas decorated with incised ornament, comparable to those on the 'platforms' in the mega-structure (ADS LINK TO 5_2_2_2_1_HOUSE_B17_PHOTOS/B17_H10_platform; 5_2_2_2_1_HOUSE_B17_PHOTOS/B17_O11_platform; 5_2_2_2_1_HOUSE_B17_PHOTOS/B17_P12_platform). At least one platform was stratified under daub tumble (ADS LINK TO Fig. B17_ platform under daub). Two hearths were found near the platforms. Up to eight sherd scatters in House B-17 corresponded to groups of once-complete pots, comprising smaller and medium-sized vessels but no storage-jars (ADS LINK TO 5_2_2_2_1_HOUSE_B17_PHOTOS/B17_M10_pot_scatter; 5_2_2_2_1_HOUSE_B17_PHOTOS/B17_pot_scatter).

The pit to the North West of House B17 proved to be much bigger than the geophysical anomaly, amounting to 8m in diameter and 3.5m at its deepest point, near the Northern edge. The Southern edge of the pit came within 1m of the Northern edge of House B17 but this shallow area increased in depth as one moved North. The upper fill was a chernozem with a huge amount of small sherds and animal bones.

There were many placed deposits in the pit, which was extremely rich in material remains. At 1.2 – 1.3m depth, a sloping layer 10 – 25cm-thick contained many large sherds and animal bones (ADS LINK TO 5_2_2_2_3_PIT_B17_PHOTOS/Pit_B17_main_scatter_1), including a *Bos* horn core (ADS LINK TO 5_2_2_2_3_PIT_B17_PHOTOS/Pit_B17_P3_Bos_horn). This layer sloped into the centre of the pit at 1.6 – 1.8m depth and contained 14 finds concentrations, some with anthropomorphic female figurines (a total of over 20 was found in the pit as a whole) (ADS LINK TO 5_2_2_2_3_PIT_B17_PHOTOS/Pit_B17_P14_figurine). Under this layer was a burnt daub layer 5 – 10cm thick, which overlay a 2 – 3cm-thick charcoal layer; 10 – 20cm deeper was a second charcoal layer separated by a yellow loessic sediment from the upper charcoal layer (ADS LINK TO 5_2_2_2_3_PIT_B17_PHOTOS/Pit_B17_NE-facing_profile). Many sherds and animal bones were recovered from all of these layers. A special style of pottery consisted of many sherds with incised decoration, starting at 1.2 – 1.3m depth. This type of incised decoration was rare in House B-17 (only one case). The same was true for the fragments of large vessels 0.80m high found in the pit.

The pit to the North of House B18 held fewer finds but was even larger than the B17 pit, although only an 8m-long section was excavated to a depth of 2.5m (ADS LINK TO 5_2_2_2_4_PIT_B18_PHOTOS/Pit_B18_2.50m depth). The upper fill, to 1,2m depth, was a chernozem (ADS LINK TO 5_2_2_2_4_PIT_B18_PHOTOS/Pit_B18_1.20m depth); under this layer, the cultural layer shared the same properties as in the B-17 Pit, with a total of four anthropomorphic figurines.

It is clear that the initial use of both pits was to extract clay for house-construction. Both pits were partially filled-in at the time of dwelling. The pits were still visible as negative features at the time of the end of the settlement: the upper fill consisted of a lower layer of soil mixed with cultural material, and an upper layer formed by chernozem.

The linear-pits were dug on three sides of House B17 but were much more shallow than the B17 or B18 pits. The primary use of all of these pits could have been to produce soil for mixing with clay in house construction, as in the LBK system of digging pits close to houses. These pits were much more shallow than the pits at the short end of the houses – usually no more than 30cm depth. In the linear pit near House B-17 were found sherds, animal bones and fragments of three anthropomorphic figurines. The further the linear pit was laid out from the house, the fewer the finds that were discovered. By the time of the house-burning, and unlike the larger pits, the linear pits had filled up to the general surface level.

Soil micro-morphology, House B17 (ADS LINK TO 5_2_2_2_5_MICROMORPHOLOGY_HOUSE_B17; ADS LINK TO 5_2_2_2_6_MICROMORPHOLOGY_PIT_NEAR_HOUSE_B17)

These samples capture a sequence of Chernozem soils frequently interspersed with burnt daub above and below the *ploschadka* platform. The samples are predominantly composed of a dark greyish-brown, silty quartz groundmass with undifferentiated b-fabrics—in other words, a fabric similar to the natural Chernozem A horizon. However, in contrast to the natural soils, the overall structure is more chaotic, showing less well-developed (or less well-preserved) pedality, and dominated by porous (spongy to granular) microstructures. There is less clear evidence for bioturbation by soil mesofauna, indicated by the presence of shell fragments. The large vertical channels may indicate disruption by rootlets. Such bioturbation could also explain the presence of plant matter in the pore spaces above and below the burnt daub platform, where few organic remains other than charcoal are observable.

Charcoal, although mostly silt-size and smaller, is ubiquitous and appears to be slightly more common than in the natural soils. However, apart from the charcoal and the burnt daub, no other indicators of fire (e.g. ash or heat-transformed sediments) are observed.
It is unsurprising that burnt daub is abundant in these samples. The daub appears to have been composed of tightly packed silt-size quartz supported in a matrix not dissimilar to the Chernozem soil. The fragments are angular to rounded, smooth, a few millimetres to several centimetres across, and spread out within the soil matrix, possibly due to post-depositional modifications such as transportation, mechanical compression, and bioturbation. Degrees of

heat alteration are indicated by the range of yellow to red colours and optically inactive, undifferentiated b-fabrics probably resulting from the firing of clay in temperatures exceeding 800–850°C (Macphail & Goldberg 2010; Quinn 2013). However, no dewdrop-shaped quartz grains could be observed at the available magnifications, suggesting that temperatures did not greatly exceed these readings (cf. Courty *et al.* 1989). Uneven firing or post-depositional dissolution are suggested by the presence of a spongy, laminated calcitic pendent on one fragment. High temperatures also appear to have removed nearly all organic material embedded within the daub, leaving behind planar voids (plant pseudomorphs) indicative of such organic inclusions (Courty *et al.* 1989; Macphail & Goldberg 2010).
As in the natural soils, the presence of micritic coatings and pendents indicates post-depositional calcite precipitation in hydrologically dynamic calcareous sediments.
Other than daub, there is little evidence for anthropogenic modifications or materials in the burnt house samples. The lack of compaction features (e.g. subparallel horizontal voids or compacted fabrics) may be partly attributed to the fragmentary nature of the samples (especially NB13[2]/2B). The homogenising effects of bioturbation could also explain the absence of any identifiable structural features (cf. French & Milek 2012). Similarly, bioturbation and heat insulation could explain the absence of heat-altered sediments below the daub platform (cf. Canti & Linford 2000). The absence of cultural inclusions other than daub reinforces field observations of houses that the houses are relatively impoverished of biocultural materials (Chapman *et al.* 2014a).

In summary, the burnt house did undoubtedly undergo pyrogenic alterations. The daub indicates high burning temperatures, corroborated by the presence of charcoal in slightly higher abundances than in the natural soil. Otherwise, however, there is very little micro-scale evidence for how the structures were built or what they were used for. The lack of cultural inclusions other than daub suggests that the building was cleared of debris, probably prior to burning. Altogether, the high degrees of bioturbation and charcoal degradation indicate a dynamic post-depositional environment where many expected signs of domestic life have been transformed or translocated beyond micromorphological recognition. This is supplemented by the observation that Chernozem soil has accumulated on top of the burnt remains, indicating continuous soil formation under relatively stable conditions after the settlement was abandoned. Whether and how Trypillian or later pre-modern land management contributed to this soil formation is, however, beyond the scope of this study.