

5_4_1_Pit,_Sondazh_1/2013_&_2014,_with_soil_micromorphology

A trench (termed Sondazh 1), 6.70 - 6.95m East – West x 3.97 - 4.07 m North – South was set over a large geomagnetic anomaly, which turned into a pit so large that it required two seasons' of excavations (2013 - 2014). In the South wall of the trench, an identical profile to that found in Sonda 2 was encountered: an A horizon to 0.45m depth, with a B horizon dominated by carbonate in-washing to a depth of 1m.

The first 40 cm from the surface were excavated over the entire area in two 20-cm spits. Although there were sherds in both layers, clear concentrations of archaeological materials and pit boundaries were not identifiable. This imposed a change of excavation strategy, with subdivision of the trench into a North and a South sector and identification of finds concentrations to define the blurred edges of the pit. A combination of factors - collapsed pit walls in the past, 'sinking' of heavy material in the loess, later re-cuts and very intensive animal burrowing activity - has contributed to a situation whereby the 'original' pit walls are difficult, if not impossible, to define and archaeological materials are found 'outside' the pit.

A consideration of the pit stratigraphy prompted a division into five 'Stratigraphic Units' (SUs), numbered 1 to 5 from the earliest to the latest (Table 1).

Table 1 Stratigraphic division

Stratigraphic Unit	Depth	Fill	Depth of Episodes
1	146,94 - 147,51	Basal part of two test boxes - one in Zone 1 and the other in Zone 2 - (2013), with lower part of fill in Zone 2 (2014); four Episodes, containing a very high proportion of pottery	Zone 2/ 147,51 - 147,38 Zone 2/ 147,50 - 147,40 Zone 2/ 147,30 - 147,15 Zone 2/ 147,07 - 146,94
2	147,2 - 147,82	Crumbly black-brown fill mostly in Zone 2; two Episodes, containing overwhelmingly pottery	Zone 1/ 147,50 - 147,41 Zone 1/ 147,37 - 147,27

3	147,35 - 147,75/70	Crumbly black-brown fill in all Zones; eight Episodes with more varied deposits, including a <i>Bos</i> horn-core, an anthropomorphic figurine, grindstones, chipped stone, other bone, charcoal and daub, as well as much pottery	<p>Zone NE/ 147,69</p> <p>Zone NE/ 147.66 - 147,48</p> <p>Zone 3/ 147,41 - 147,35</p> <p>Zone 2/ 147,7 - 147,6</p> <p>Zone 2/ 147,67 - 147,56</p> <p>Zone 1/ 147,68 - 147,56</p> <p>Zone 1/ 147,58 - 147,48</p> <p>Zone 1/ 147,45</p>
4	147,75/70 - 148,25	Crumbly black-brown fill in all Zones, with the uppermost fill representing the top of the pit in Trypillia times. The largest number and diversity of Episodes (n = 16), with occasional examples of only bone or only pottery, but often the combination of pottery + bone + chipped stone+ daub.	<p>Zone NE/ 148,17 - 147,99</p> <p>Zone NE/ 148,16 - 147,89</p> <p>Zone NE/ 147,8 - 147,67</p> <p>Zone 2&3/ 148,05 - 147,94</p> <p>Zone 2&3/ 148,05 - 147,75</p> <p>Zone 2&3/ 148,04 - 147,73</p> <p>Zone 3/ 148,16 - 148,04</p> <p>Zone 3/ 147,99 - 147,86</p> <p>Zone 2/ 148,01 - 147,91</p> <p>Zone 2/ 147,87</p> <p>Zone 1/ 148,25 - 148,15</p> <p>Zone 1/ 147,95 - 147,85</p> <p>Zone 1/ 147,89 - 147,8</p> <p>Zone 1/ 147,85 - 147,76</p> <p>Zone 1/ 147,85 - 147,85</p> <p>Zone 1/ 147,81 - 147,79</p>

5	148,25 - 149,56	Chernozem A horizon (topsoil); much of this deposit is a post-Neolithic soil build-up and therefore containing material ploughed up from the uppermost pit layer.	-
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In both years' excavations, concentrations of finds which we term 'episodes' were readily distinguishable from the background noise of low-level sherd discard. A total of 30 episodes was identified ([ADS LINK TO 5_4_4_SPREADSHEETS/5_4_4_3_EPISODES](#)), sometimes marked by indices of burning, with a high proportion of ceramic clusters and rather fewer striking animal bone deposits. By far the higher frequency of Episodes came in middle layers of the pit, especially in SU 4. The initial interpretation is that the beginning and the end of a fill episode was marked in material ways. Three AMS dates from the pit (a fourth date was an outlier) show an overlap at 1 sigma, with a weighted mean of 5012 \pm 21 BP, which calibrates to 3940-3880 BC (32.8%) or 3800-3710 BC (62.6%) ([ADS LINK TO 5_4_2_9_AMS/5_4_2_9_1_Pit_Sondazh_1_COMBINED_DATES](#)). There are so few dates that a sensible estimated duration of pit deposition cannot be made ([ADS LINK TO 5_4_2_9_AMS/5_4_2_9_2_Pit_Sondazh_1_duration](#)). We can cautiously suggest that the pit was oval in shape at its mid-depth, while its upper part was much larger and amorphous in shape.

Soil micro-morphology of Pit, Sondazh 1 ([ADS LINK TO 5_4_2_8_SOIL_MICROMORPHOLOGY](#))

Broadly speaking, the pit fill and the sediment into which it was cut resemble the natural Chernozem A and B horizons, respectively. However, bio-cultural inclusions in the former distinguish it from all the other contexts included in this study.

The pit fill resembles the Chernozem A horizon in terms of its spongy structure, a highly melanised groundmass composed primarily of coarse silt-size quartz, and common bioturbation expressed as channels and granular infillings. However, in contrast to the Chernozem or the house features, the fill has a far higher abundance of coarse organo-cultural

inclusions. Burnt daub (or ceramic?) fragments are similar to those encountered in the houses (c.f. Chapman *et al.* 2014a: 380). Another inclusion of a possibly cultural origin is a large heterogeneous aggregate composed of up to sand-size quartz, limestone, plant tissue residues, shell and a piece of a broken-up iron nodule embedded in a clayey micromass. Although more detailed comparative studies are needed, this may be provisionally interpreted as a fragment of pottery, comparable to petrographically studied Cucuteni pottery from Romania showing similar composition of oriented minerals (e.g. quartz, feldspars and calcareous) embedded in a clay mass showing undifferentiated to isotropic b-fabrics (Ionescu & Hoeck 2011). A fragment of compact bone, probably unburnt given its transparent (creamy) colour (PPL) and first-order grey birefringence tending towards blue–green (Karkanis & Goldberg 2010; Weiner 2010: 118) indicates more varied and abundant biological materials in the pit fill than in the natural soils or houses. There is also a higher abundance of large charcoal fragments in the fill, discussed further below.

Structurally, the pit lacks observable evidence (e.g. laminations, compaction) for distinctive infilling episodes. This may be due to several exclusive reasons, not distinguishable micromorphologically: 1) The samples do not capture transitional boundaries indicative of discreet infilling episodes; 2) The pit was filled in a single event; 3) Bioturbation has homogenised structural variation beyond microscopic recognition.

In contrast to the anthropogenically-enriched fill, the sediment into which the pit was cut lacks any cultural inclusions and closely resembles the natural Chernozem B horizon. The groundmass is less melanised than in the fill, probably owing to the virtual absence of charcoal except where dark soil has intruded via biogenic channels, also transporting burnt daub from above. Such biogenic activity might ultimately erase the boundaries between the fill and its surrounding sediment, although as yet such homogenisation seems to have played a relatively minor part in the sampled locations.

The contrast between the fill and the natural sediment provides an opportunity to better understand charcoal taphonomy at Nebelivka. Among all the samples studied, the charcoal fragments are the most abundant and best preserved in the pit fill. The fragments appear to be concentrated in loose clusters, and often the larger fragments appear to be undergoing further *in situ* fragmentation and comminution. The virtual absence of charcoal from the

natural B horizon also suggests that the charcoal has been confined to the fill and its origin may be traced to occupation activities in the surrounding area. This has implications for understanding of charcoal taphonomy, provenance and dating at the site.

In summary, the pit fill and its sedimentary context show stark contrasts between bioculturally modified sediments and relatively undisturbed natural soils. As in the houses, high degrees of bioturbation seem to have erased evidence of any structural variations. The presence of bone, excrement and charcoal in the fill seems related to occupation activities. However, it is not clear whether these inclusions originate from the houses, which are largely devoid of such materials. Although the exact relationships between the pit and houses remains inconclusive, the presence of charcoal in the fill, and its near complete absence from the soils, provides an important supplementary line of evidence for the interpretation of charcoal taphonomy and site formation processes at Nebelivka.