Supplementary Table S4. Melnychna Krucha. Sections 1-2.

Section 1 – Figure 10-12				
Index	Depth, m	Description	Thin-section	Reference to micro-photo
Upper soil (0.0-0.85 m (measurements taken from the surface above the profile)				
Hd	0.0-0.05	light grey, loose, sandy light clay loam with some root traces		
Hk	0.05-0.4	humus horizon: grey, with light brownish shade, loose, blocky-granular, sandy light clay loam. It is cut by plant roots and burrowing animals' holes filled with grey material. It moderately reacts with HCl (10%)	In thin-section, the sample from this horizon (0.1-0.2 m deep) yielded light grey material with a spongy texture consisting of loose carbonate and clayish micro-aggregates up to IV order (up to 0.3 mm in diameter). The larger micro-aggregates are formed around primary concretions made of humus, clay, and carbonates (d 0.02-0.04 mm). Pores comprise around 40% of the thin section surface, while the mineral skeleton accounts for around 60% of the surface. Humus belongs to the moll type. The background shows a weak anisotropy; it is saturated with microcrystalline calcite. The grains are rounded quartz in the shape of large silt up to 0.04 mm in diameter. There are sand grains (d 0.1-0.3 mm) in pores and sparse crystals of $CaCO_3$.	Figure 11, I а.б
Hpk	0.4-0.7	pale yellow, the light-grey horizon, looser and lighter by color than the horizon above. It is granular - silty by structure, sandy clay loam with many burrowing animals holes. It reacts with HCl (10%).	In thin-section, the sample (0.5-0.6 m deep) consists of yellowish–light grey material of spongy texture with complex micro-aggregates of III-IV order up to 0.3 mm in diameter, some smaller micro-aggregates of 0.1-0.15, as well as concretions of pure humus (0.02-0.4 mm). The pores take up around 30% of the thin-section surface. The weakly anisotropic background is partially shaded by humus. The mineral skeleton consists of rounded silty grains of quartz (up to 0.05 mm in diameter) with a few grains of zircon and sandy grains of 0.1-0.4 mm, surrounded by carbonate–clayish shells. The background is filled with microcrystalline calcite with some large crystals of the latter and micro-concretions of $CaCO_3$	Figure 11, I в, г, д
Phk (Pk of upper soil)	0.7-0.85	it is visibly lighter than the horizon above. It is light grey–pale yellow, loose, crumbly, light sandy clay loam with many burrowing animal holes. It is well visible as a lighter horizon in the sequence.		

Section 1 – Figure 10-12				
Index	Depth, m	Description	Thin-section	Reference to micro-photo
Middle soil (0.85-1.7 m):				
Hk	0.85-1.1	a pale grey horizon. It is visibly darker than the horizon above. It is humic, loose, and granular, silty clay loam with a clear structure, cut by many burrowing animal holes. It reacts actively with HCl (10%) but has no visible carbonates. This horizon as well as the upper Phk contained artefacts of the Late Bronze Age	In thin-section, the sample (0.9-1.1 m) contains pale-grey material of spongy texture with clear micro-aggregates of two types: complex micro-aggregates up to 0.2-0.3 mm in diameter and oval concretions of humus -carbonate – clayish matter. Pores fill 40% of the thins-section's surface. The anisotropic background is filled with humus and microcrystalline calcite with large sparse crystals of CaCO3 and rounded grains of amorphous calcite (D up to 0.07 mm). The mineral skeleton is made up of quartz. The granulometric composition is characterized by the prevalence of particles of 0.02-04 mm in size, with the sporadic presence of sand grains up to 0.5 mm.	Figure 11, II а, б, в
Hpk	1.1-1.4	humic transitional pale yellow – grey horizon. It is a loose, granular silty clay loam with many burrowing animal holes. It reacts actively with HCl (10%) and contains inclusions of carbonates visible to the naked eye. This horizon yielded finds of SU1b (Eneolithic, late fifth – early fourth mill. BC).	the sample (1.2-1.3 m) demonstrates a light grey material with a spongy texture with notably larger pores. The micro-aggregates comprise unclear complex micro-aggregates, oval concretions of humus, carbonate, and clay, as well as micro-aggregates of 0.05-0.3 mm in size. Pores cover 60% of the thin-section's surface. This horizon contains more sand grains (D up to 0.25 mm) than the horizon above. The mineral skeleton comprises quartz, zoisite, and hornblende. The background is often cemented by microcrystalline calcite.	Figure 11, II д, е, ж, з
P(h)k	1.4-1.6	greyish pale yellow silty clay loam, lighter by color than the horizon above, with uneven coloring, loose with tongues of humus and spots of carbonates with many burrowing animal holes.		
Pk	1.6-1.7	– 1,6-1,7м – light pale yellow, light clay loam, with a high content of sand structure-less, cut by pale and grey burrowing animal holes. The horizons P(h)k and P(k) yielded artifacts of SU3, dated by radiocarbon analysis to the 5966-5661 calBC.	the sample (1.6-1.7 m deep) shows light yellow matter with flat relief. The anisotropic background is cemented by microcrystalline calcite of spongy texture, with many isometric pores, pores-channels and wavy pores. The micro-aggregates are primary carbonate – clayish and grains of primary micro-aggregates with carbonate shells. The mineral skeleton comprises many rounded	Figure 11, II и, к, л, м

Section 1 – Figure 10-12				
Index	Depth, m	Description	Thin-section	Reference to micro-photo
			grains of sand (0.06-0.4 mm). The sand accounts for at least 10% of the total matter of the mineral skeleton. It mainly consists of quartz grains.	
Lower soil (1.7-2.1 m)				
Hpk (gl)	1.7-1.9	humus horizon with interchanging layers of grey and brownish-grey stripes 5-7 cm wide. It is loose, light sandy clay loam containing shell fragments and small pebbles. The multiple sub-layers are divided by rusty brown lines indicating periodic hydromorphic conditions. This layer yielded artifacts of SU3 dated by radiocarbon method to 6461-6100 calBC.	In thin-section, the sample (1.7-1.8 m deep) demonstrates striped matter: brownish, grey, and pale-yellow stripes. The horizon contains many sand grains, sometimes clearly ferruginated. The structure is cellular—the spots of ferrugination alternate with carbonate-filled spots. The matter is porous (pores cover over 50% of the thin-section's surface). The mineral skeleton mostly consists of quartz grains (0.1-0.4 mm). The background is cemented by microcrystalline calcite. There are sparse, rounded grains and crystals of CaCO3 alongside carbonate – clayish micro-aggregates up to 0.3 mm in diameter.	Figure 12, I а-д
Phkgl	1.9-2.1	the horizon is similar to the horizon described above but is lighter in color and contains more sand.		
Pk	2.1-2.2	pale-yellow and grey sandy clay loam continues under the bottom of the excavation pit. Horizons Phkgl and Pk yielded artifacts of SU4 dated by radiocarbon method to 7520-7315 calBC.	In thin-section, the sample 2.1-2.2 deep demonstrates the loose sandy matter. The sand grains (0.05-0.15 mm) are unevenly distributed in a carbonate clayish light background. There are primary carbonate–clayish micro-aggregates. The striped outlook of the sample is defined by the interchanging pattern of the stripes cemented by microcrystalline calcite and porous structure-less stripes	Figure 12, I е-р

Section 2 — Figure 12-II, 13				
Index	Depth, m	Description	Thin-section	Reference to micro-photo
Hd		grey, loose, sandy light clay loam with some root traces		
H		humus horizon	a spongy texture, a loose packing of mineral skeleton grains, a loose packing of mineral skeleton grains with low organic content	Figure 12 II, а, б в, г

Section 2 — Figure 12-II, 13				
Index	Depth, m	Description	Thin-section	Reference to micro-photo
Hpk		humic transitional horizon	micro-aggregates barely touched by humus, loose packing of mineral skeleton grains	Figure 12 II, д, е –; ж, з
P		light grey–pale yellow, loose, crumbly, light sandy clay loam		
al	are visible up to 4 m deep	the alluvial sands forming the base of sequence		

Numerical symbols: clots of humus (1), complex micro-aggregates (2) a porous system (3), a plant root (4), grains of large and medium silt (5), sand grains (6), carbonate-clayish matter (7), channel pores (8), large crystals of $CaCO_3$ (9), ferrugination spots (11); the matter filled (12), cemented (13) with micro-crystalline calcite, large crystals of calcite (14), freshwater shells' fragments (15), the gleyic matter (16).