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Hlinsko – Kouty I. Bifacial point with four refitted flakes (Fig. 3, Pg. 23).

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Doba římská a doba stěhování národů, Roman Age and Migration Period, Römische Kaiserzeit und Völkerwanderungzeit

Editorial

Vážení přispěvatelé a čtenáři časopisu Přehled výzkumů,

poměrně nedávno, konkrétně v čísle 57-1 jsme si připomněli malé výročí: uběhlo 60 let od rozhodnutí tehdejších pracovníků Archeologického ústavu ČSAV v Brně založit a vydávat časopis Přehled výzkumů. Jak již název napovídá, jeho cílem bylo referovat nejen o aktuálních terénních výzkumech, ale taktéž publikovat analytické příspěvky a teoretické stati. Protože vydavatel i redakce musejí reagovat na aktuální situaci v oboru i na trhu publikací, snaží se o neustálé zkvalitňování časopisu. Toto nikdy nekončící úsilí bylo aktuálně oceněno zařazením časopisu Přehled výzkumů do mezinárodní databáze SCOPUS, konkrétně od ročníku 58 (v databázi ERIH+ a na seznamu recenzovaných časopisů vydávaných v ČR zůstává i nadále). Protože časopis je již několik let k dispozici nejenom v tištěné, ale i elektronické formě (open access), bylo mu od ročníku 59 přiděleno též ISSN 2571-0605 pro jeho elektronickou verzi.

Studie v čísle 59-1 prezentují výzkum v jeskyni Pod hradem v Moravském krasu se zaměřením na objev baltského jantaru (L. Nejman et al.), nový detailní rozbor materiálu z lokality tzv. Pomoravského aurignacienu v Hlinsku (Yu. Demidenko et al.), výzkum klasické lokality pavlovienu Dolní Věstonice I v 90. letech minulého století (J. Svoboda et al.), studii o vybraných aspektech nakládání s lidskými ostatky v pavlovienu (S. Sázelová et al.) a příspěvek k možnostem modelování tras tažení římské armády proti Marobudovi (M. Vlach). Rádi bychom, aby publikované příspěvky byly přínosným stimulem do diskusí nad dotčenými tématy. Jako každoročně, část nazvaná Zprávy o výzkumech předkládá základní informace o archeologických terénních aktivitách na Moravě a v české části Slezska v roce 2017.

V Brně, 30. června 2018,
Petr Škrdla jménem redakční rady

STUDIE A KRÁTKÉ ČLÁNKY
CASE STUDIES AND SHORT ARTICLES
STUDIEN UND KURZE ARTIKEL

Recenzovaná část

Peer-reviewed part

Rezensierter Teil

Dolní Věstonice I. Excavations 1990–1993
Dolní Věstonice I. výzkum v letech 1990–1993

Jiří Svoboda, Martin Novák, Sandra Sázelová, Šárka Hladilová, Petr Škrdla

Abstract

Large-scale excavations of complete Gravettian living-floors at Dolní Věstonice I were primarily realised between 1924–1952 whereas later fieldwork had rather a character of separate trenches. Here we report the results of last excavation organized at this site in 1990 and 1993. A series of trenches along the western and southern boundary brought additional chronostratigraphic and archaeological evidence concerning the overall situation of the site. In the lower part of the site we detected superimposed charcoal deposits dated by C^{14} to Early Gravettian but without artefactual context. In the uppermost part we identified the previously excavated units K2 and K3 and we show that these were discrete instalations dated to the Evolved Gravettian (Pavlovian). With the newly acquired data, this paper addresses the questions of general stratigraphy and local microstratigraphies, radiometric chronology, center-periphery relationships (on levels of the whole site and of the individual residential units), and structure of relevant faunal and lithic assemblages.

Keywords

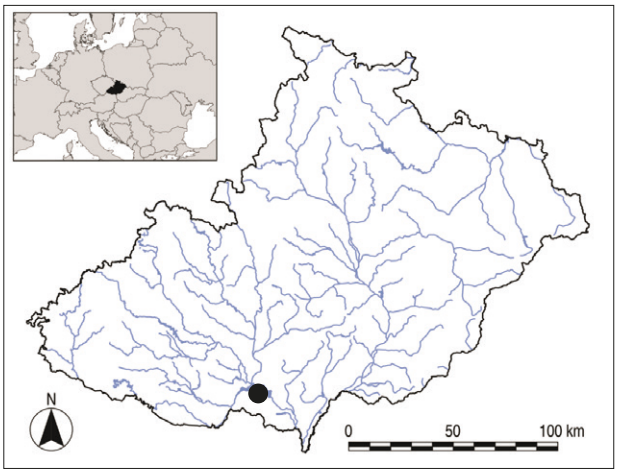
Gravettian – chronostratigraphy – microstratigraphy – settlement structure – Dolní Věstonice I – Czech Republic

1. Introduction

As a part of the Dolní Věstonice – Pavlov – Milovice settlement area, the site of Dolní Věstonice I (DV I) has the longest excavation history and renomed artefactual record, with early modern human fossils and classic items of Gravettian art, including the iconic Venus of Věstonice (Fig. 1–3; Bayer 1924; Jüttner 1939; Absolon 1938a, b; 1945; Klíma 1963; 1969; 1983a; Tomášková 1995; Trinkaus, Svoboda, eds., 2006; Eickhoff 2013; Kostrhun 2014; Oliva 2014; Svoboda 2016). However the complex depositional context, the discontinuities among subsequent research stages and the lack of communication between some of the leading excavators make a retrospective interpretation of this site problematic (cf. Klíma 1981a; 1983a; 2001; Verpoorte 2000; Oliva 2014; Svoboda 2016). Here we report results of the last fieldwork realised at this site by the Institute of Archaeology, Czech Academy of Science, in 1990 and 1993.

2. Aim of the excavation and research strategy

Archaeological evidence from nearby Gravettian sites DV II and Pavlov I allows us to combine previous and actual researches into a more-or-less coherent whole, but at site DV I, given the complex research history (Tab. 1), this task becomes more difficult than elsewhere. Early during the 20th century as the site has still been covered by a mosaic of fields and wineyards, it was explored by surface surveys (all researchers), by fieldworks of various size in the most promissing central parts (Absolon, Bohmers, Klíma), and by



Location of the site on a map of Moravia.
Poloha studované lokality na mapě Moravy.

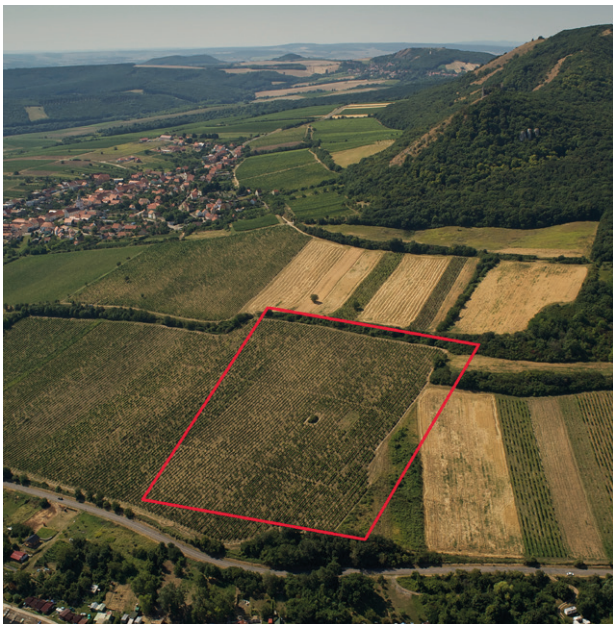


Fig. 1. Dolní Věstonice I, situation of the site in the landscape. The oblong area corresponds to Fig. 2. Photo P. Pokorný.

Obr. 1. *Dolní Věstonice I, situace lokality v krajině. Obdélník odpovídá obr. 2. Foto P. Pokorný.*

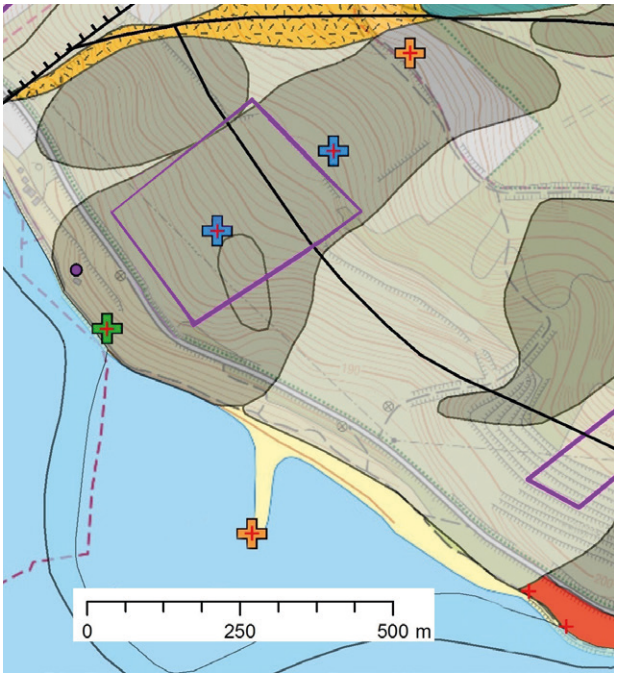


Fig. 1a. Dolní Věstonice I, spatial extension of the main landslide bodies (in grey). After https://mapy.geology.cz/svahove_nestability/. Crosses – geological borings.

Obr. 1a. *Dolní Věstonice I, prostorové rozložení hlavních sesuvných těles (šedě). Výřez z https://mapy.geology.cz/svahove_nestability/. Kříže – geologické vrty.*

a network of boreholes around (Žebera in Knor *et al.* 1953; Klíma 1963). The early archaeological borings are difficult to interpret given the limitation in depth at that time (2–3 m), lower readability of sediments in the cores and the lack of artefacts.

Large-scale excavations of complex prehistoric living-floors at DV I were primarily realised before 1952 and later fieldwork had rather character of separate trenches (at that time, larger excavation projects moved to Pavlov I and DV II). Following the agricultural recultivation during the 1970´s, the whole site turned into a unique wineyard. Given the unaccessibility of the cultivated parts in center and our focus on site-boundaries (including the potentials of research continuation), we located one series of trenches along the western margin (N–S: trenches 1–6a/90) and another one along the southern margin (E–W: trenches 7–12/90 and 7a/93) (Fig. 5–6; see Svoboda 1993; Svoboda *et al.* 1997 for preliminary annual reports). One year later, Klíma and Haesaerts made a stratigraphic test trench in the area of previously excavated mammoth bone deposit (Klíma 1969; 1995a). Finally, additional loess sections were opened by a road in the upper neighbourhood of the site and by house constructions along the lakeshore below, both archaeologically sterile (Svoboda *et al.* 2009).

Although the 1990–1993 trenches did not result in additional spectacular discoveries, the newly acquired data address the questions of general stratigraphy of the site and local microstratigraphies, radiometric chronology, center-periphery relationships (on levels of the whole site and of the individual residential units), and structure of the faunal and lithic assemblages in peripheric areas. Not all of these questions can actually be resolved.

Excavator	Time-span	Key references
Various surveyors	1922–1923	Bayer 1924
Karel Absolon	1924–1938	Absolon 1938a, b; 1945
Assien Bohmers	1939–1942	Bohmers 1941
Karel Žebera et al.	1945–1946	Knor et al. 1953
Bohuslav Klíma	1947–1952, 1966, 1971–1979, 1994	Klíma 1952; 1963; 1969; 1981a, b; 1983a, b; 1995a
Jiří Svoboda et al.	1990, 1993	Svoboda 1993; Svoboda et al. 1997

Tab. 1. Dolní Věstonice I, review of the key excavation stages.

Tab. 1. *Dolní Věstonice I, přehled hlavních etap výzkumu.*

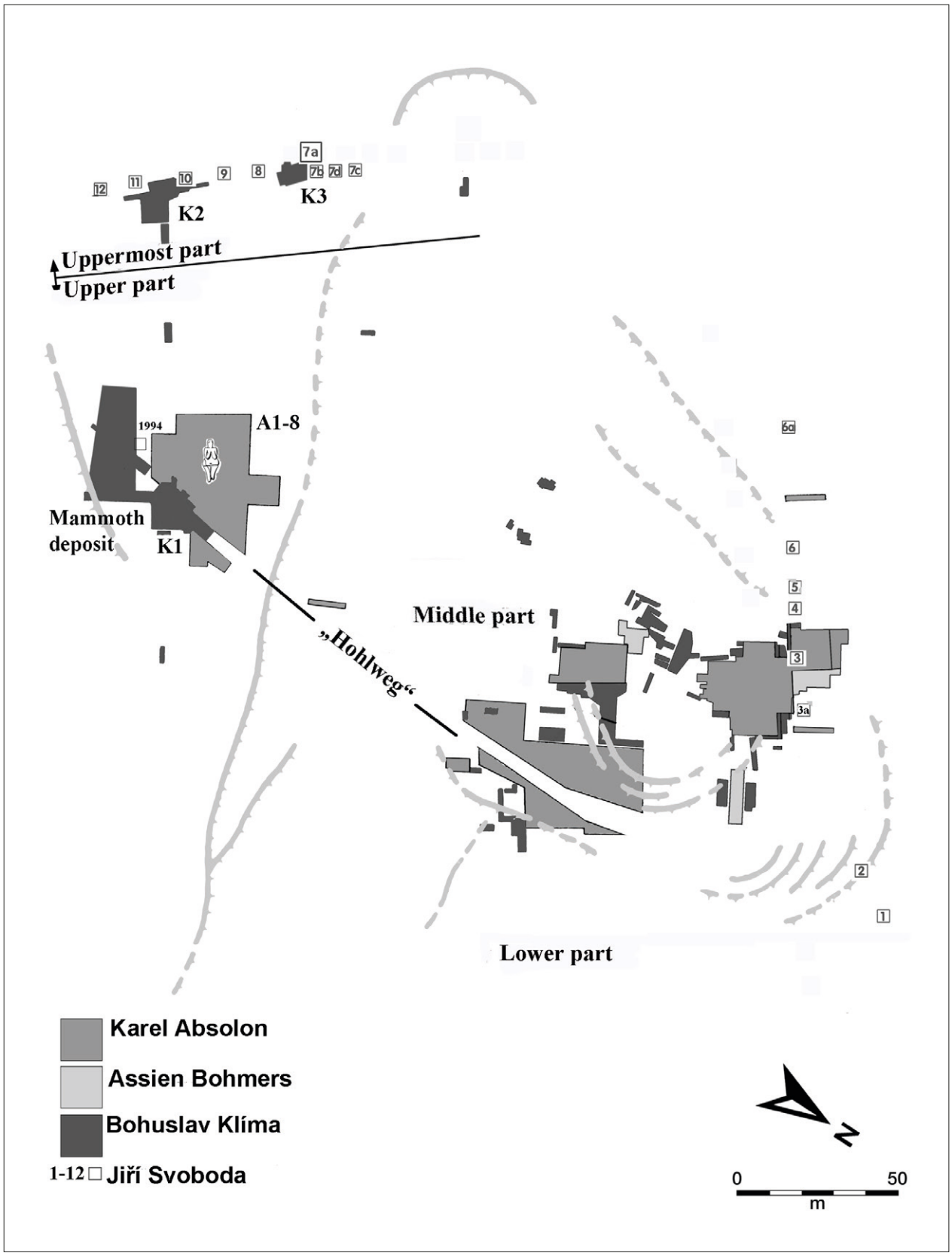


Fig. 2. Dolní Věstonice I, general plan of the site showing the excavated areas, Absolon´s units A1–8 (with the findspot of the Venus of Věstonice indicated), Klíma´s units K1–3, and location of the 1990–1993 trenches (using plans by Klíma 1983 and precising location of trenches in Verpoorte 2001). Graphic J. Svoboda and P. Hájková.

Obr. 2. *Dolní Věstonice I, celkový plán s vyznačením prozkoumaných ploch, Absolonových celků A1–8 (s vyznačením nálezu Věstonické venuše), Klímových celků K1–3 a sond z let 1991–1993 (s využitím plánů Klímy 1983 a upřesněním polohy sond u Verpoorte 2001). Grafika J. Svoboda a P. Hájková.*

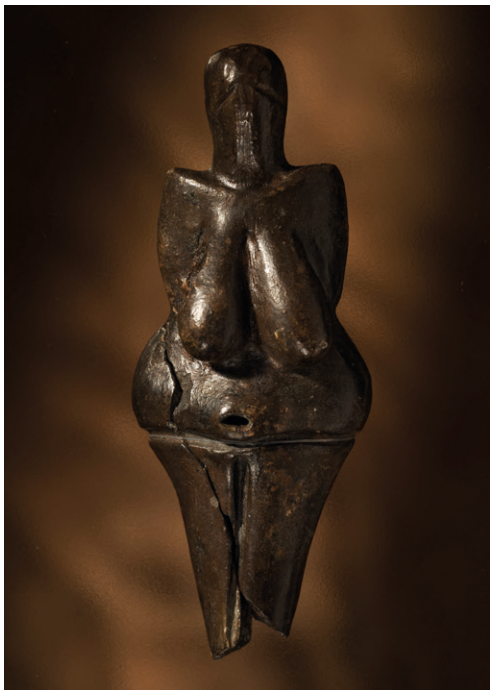


Fig. 3. Dolní Věstonice I, the site´s iconic figurine – the Venus of Věstonice, discovered on July 13, 1925. Coll. Moravian Museum. Photo M. Frouz.

Obr. 3. *Dolní Věstonice I. Ikona lokality – Věstonická venuše, objevená 13. července 1925. Sbírky Moravského zemského muzea. Foto M. Frouz.*

Fig. 4. Dolní Věstonice I – lower part, view of the 1990 excavation with trenches 1–2/90 in foreground. Photo J. Svoboda.

Obr. 4. *Dolní Věstonice I – spodní část, pohled na výzkum 1990 se sondami 1–2/90 v popředí. Foto J. Svoboda.*

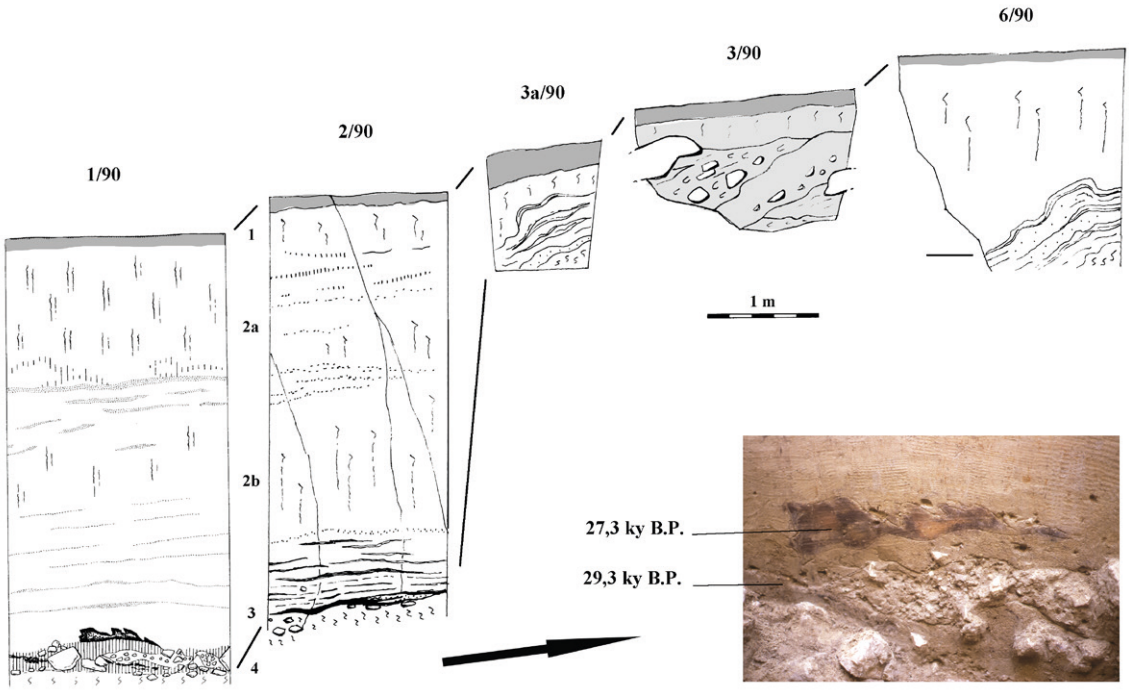


Fig. 5. Dolní Věstonice I, synopsis of stratigraphic sections along the western margin (N–S, trenches 1–6a/90). Numeration of the layers in text. Graphic and photo J. Svoboda.

Obr. 5. *Dolní Věstonice I, synopse stratigrafických profilů podél západního okraje lokality (S–J, sondy 1–6a/90). Číslování vrstev v textu. Grafika a foto J. Svoboda.*

3. Stratigraphy and chronology

Although less complex compared to the nearby Upper Pleistocene profile at DV II – brickyard (Antoine *et al.* 2013), site DV I yielded a number of partial sections from various parts of the site (Žebera in Knor *et al.* 1953; Klíma 1963; 1983a), and the results are incorporated in overall stratigraphic schemes of the central European Upper Pleistocene (Haesaert *et al.* 2004; 2010).

Geological and geophysical survey supported by LIDAR data show that the site is located on the body of extensive basal landslides composed of redeposited Tertiary (Neogenic) marls and silts mixed with Jurassic limestone rubble (https://mapy.geology.cz/svahove_nestability/, Fig. 1a). Locally, this surface was covered by Pleistocene (predominantly MIS 3) paleosols and/or pre-Gravettian loess sedimentation. These situations were affected by repeated events of prehistoric human activity, additional landsliding and erosion, frost features, microtectonic dislocations and subsidence of layers. The irregular pre-Gravettian and Gravettian paleorelieph was subsequently filled and leveled by a massive LGM loess coverage. As a result, the actual position of the archeological layer varies from surface locations to 6 m depth.

Although preservation and development of the key stratigraphic members in the individual trenches are variable from case to case (Fig. 5–6, 8–9), our descriptions will follow the same sequence: (1) Subrecent refills, earlier Holocene soils, or actual arable soil; (2) Loess of variable origin (LGM and earlier) and composition (sandy components, gleyfication, geochemical characters); (3) Complex of Gravettian anthropogenic deposits and underlying paleosols; (4) The basal landslides – Jurassic limestone rubble, Tertiary marls, silts, etc.).

3.1. Lower part – Trench 1/90

(dimensions 3 × 2 m, depth 4.5 m; Fig. 4–5)

1. Arable soil (0–15 cm);

2a. Light-greyish loess; at the base a bluish, deformed initial gley horizon (15–130 cm);

2b. Light loess with horizons and lenses of coarse-grained sand and a brownish loamy horizon at the base (130–360 cm);

3. Brownish soil sediments with sandy admixtures and charcoal (360–400 cm). The material is interstratified by small-sized sharp-edged rubble with sandy filling. Two charcoal lenses were observed in depths of 360 cm and 395 cm and both were dated – lower: GrN-18187, 29300 +750 -690 BP; upper: GrN-18188, 27250 +590 -550 BP. The upper

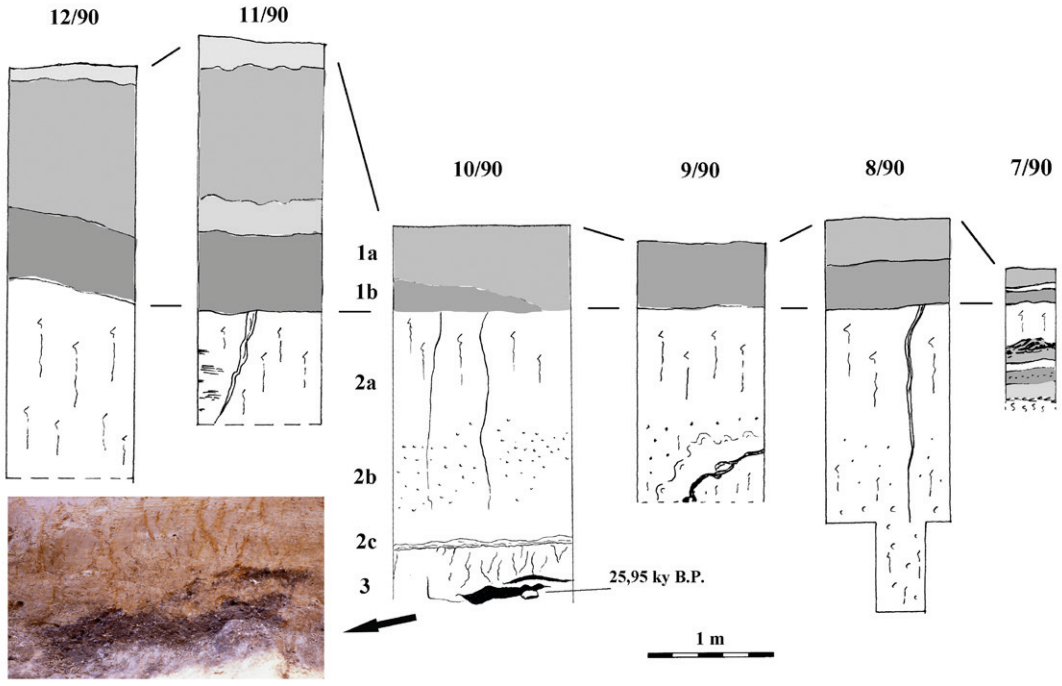


Fig. 6. Dolní Věstonice I, synopsis of stratigraphic sections along the southern margin (E–W, trenches 12–7/90). Numeration of the layers in text. Graphic and photo J. Svoboda.

Obr. 6. *Dolní Věstonice I, synopse stratigrafických profilů podél jižního kraje (V–Z, sondy 12–7/90). Číslování vrstev v textu. Grafika a foto J. Svoboda.*

location is a regular lense with a red-burnt loam inside, deformed postdepositionally, and may be considered a "hearth";

4. Greyish and rusty silts with sharp-edged limestone rubble (below 400 cm).

3.2. Lower part – Trench 2/90

(dimensions 3 × 2 m, depth 3.6 m)

1. Arable soil (0–15 cm);

2a. Light-greyish loess penetrated by vertical fissures with calcaneous filling; at the base a bluish gley horizon (15–80 cm);

2b. Light-yellowish loess with horizons and lenses of coarse-grained sand; share of sand component increases towards the base (80–300 cm);

3. Loessic and sandy material with rusty (Fe) coating, interlain with several horizons of brownish soil sediments, limestone scree, charcoal microlayers, and associated red-burnt clay horizon at the base (another "hearth"). Undeterminable bone fragment. The inclination grades along the slope (300–360 cm);

4. Yellow and grey silts with sharp-edged limestone rubble (below 360 cm).

3.3. Middle part – Trench 3a/90

(dimensions 1 × 1 m, depth 1.1 m). Archaeologically sterile.

1. Arable soil (0–30 cm);

2. Loessic clay (30–80 cm);

4. Redeposited silt and sand, bluish with rusty coating (80–100 cm).

3.4. Middle part – Trench 3/90

This trench (dimensions 2,5 × 1,5 m, depth 1.3 m) detected the already explored part of Absolon´s excavation in the middle part of the site.

1. Arable soil (0–20 cm);

2. Refill – loessic material, redeposited, with bone fragments (20–45 cm);

3. Refill – yellow-brownish clays and loessic material, redeposited, with limestone blocs; it included charcoal, brownish bone fragments (mostly mammoth) and lithic flakes (below 45 cm).

3.5. Middle part – Trench 4/90

(dimensions 2 × 1 m). Archaeologically sterile.

1. Arable soil (0–20 cm);

1a. Limestone rubble, small-sized, sharp-edged (20–35 cm);

2. Loessic clay (35–50 cm);

4. Redeposited grey-to-bluish silts with sandy interlayers, dispersed charcoal and limestone rubble (below 50 cm).

3.6. Exterior – Trench 5/90

(dimensions 1,5 × 1 m, depth 1.8 m). Later prehistoric occupation.

1. Arable soil (0–30 cm);

2. Filling of a prehistoric pit feature. Upper part dark brown clayish, with calcareous incrustations; lower part light brown, clayish-to-sandy. Undeterminable fragments of coarse reddish pottery.

3.7. Exterior – Trench 6/90

(dimensions 2 × 1 m). Archaeologically sterile.

1. Arable soil (0–10 cm);

2. Light grey loess with bluish initial gley horizons and sandy admixtures (10–180 cm);

4. Alternating bands of bluish silt, yellow sand and irregular rusty horizons. Their inclination grades along the slope (below 180 cm).

Fig. 7. Dolní Věstonice I, view of the 1993 excavation with trench 7a/93. Photo J. Svoboda.

Obr. 7. *Dolní Věstonice I, pohled na výzkum 1993, sonda 7a/93. Foto J. Svoboda.*

3.8. Exterior – Trench 6a/90

Later prehistoric occupation. Filling of a prehistoric pit feature, brown of darker or lighter coloration. No archaeological finds associated.

3.9. Uppermost part – Trenches 7, 7a–d/ 90–93

Five test-trenches (7 and 7a–d) were located along the upper (southern) margin of the vineyard, in area of Klíma´s excavation in 1978–1979 (unit K3). Position of the cultural layer was shallow in the whole area. In trench 7 (dimensions 2 × 1.5 m, depth 1 m) we identified and reopened earlier Klíma´s digs, with brown clayish refill; remains of cultural layer were partly preserved at the base. Trenches 7a–d detected disturbed situations from subsequent prehistoric occupation (relict of a hearth with an undiagnostic prehistoric potsherd), previous excavation, and construction of the actual road (Fig. 7–8).

An intact block of loess preserved in the center of trench 7, with the following stratigraphy:

1a. Arable soil (0–10 cm);

1b. Earlier Holocene soil (10–30 cm);

2. Loess (30–60 cm);

3. Black-to-greyish loam with charcoal, bones and bone fragments (60–70 cm);

3a. Loess (70–80 cm);

3b. Brown-to-greyish soil sediments with dispersed charcoal fragments (80–90 cm);

3c. Light-brownish soil sediments, with small-sized limestone scree at the base (90–110 cm);

4. Redeposited silts (below 110 cm).

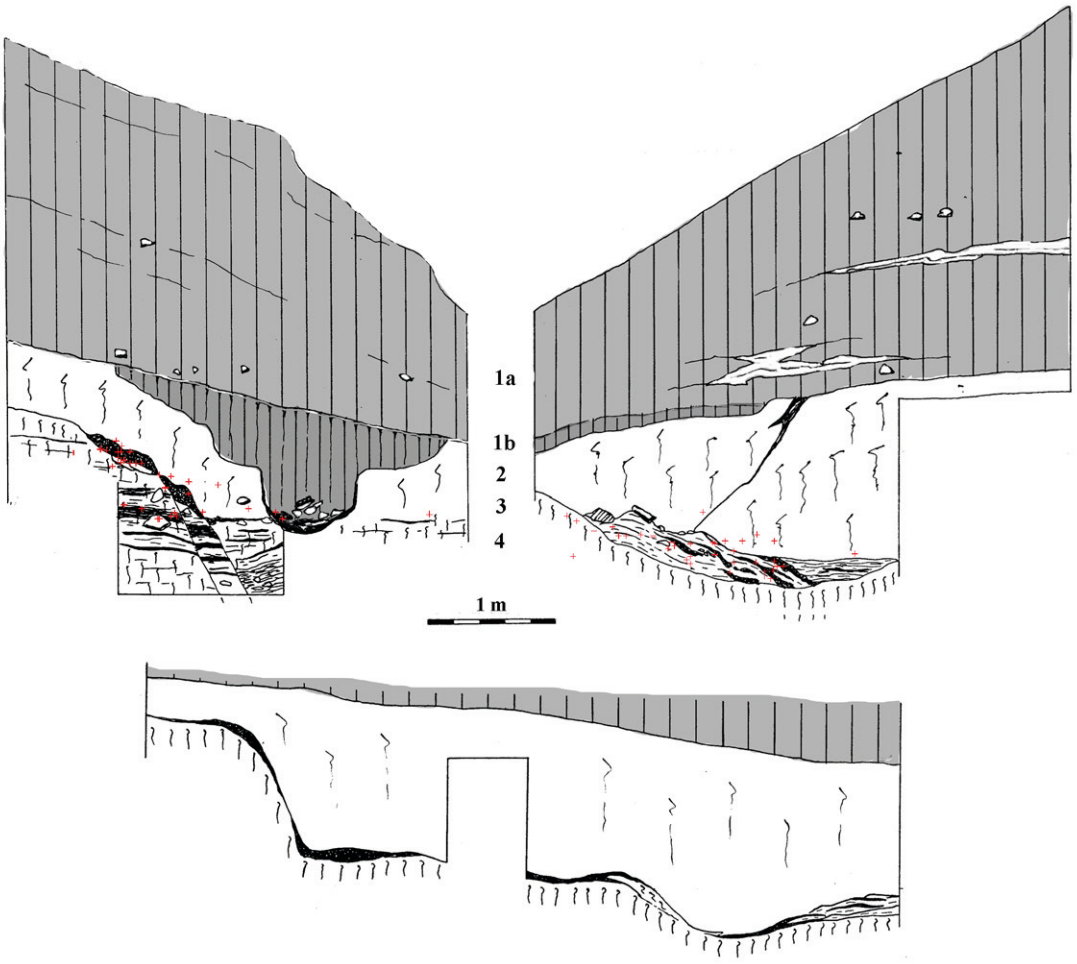


Fig. 8. Dolní Věstonice I, trench 7a/93, stratigraphic sections. Red crosses correspond to location of artefacts in 1m zone along the section. Numeration of the layers in text. Graphic J. Svoboda and P. Škrdla.

Obr. 8. *Dolní Věstonice I, sonda 7a/93, stratigrafické profily. Červené křížky odpovídají poloze artefaktů v pásmu 1m od profilu. Číslování vrstev v textu. Grafika J. Svoboda a P. Škrdla.*

3.10. Uppermost part – Trench 7a/93

In 1993 we extended trench 7/90 southwards into the hitherto unexplored area of 5 × 7.75 m at the vineyard edge. Whereas the depth at the northern end was 0.5 m only, in south it reached 4.6 m depth below 3 m of subrecent refill. A general section was as follows (Fig. 8):

1a. Subrecent refill, stratified into numerous sublayers, all with subrecent artefacts (bricks, pottery, bones);

1b. Holocene soil relict; locally filling of a protohistoric pit (dated by fragment of a bowl rim, probably La Tène);

2. Light ochreous loess with bluish and black manganese spots and rusty (Fe) coating (variable thickness);

3. Cultural complex (variable thickness). Loessic and clayish material is interstratified by deformed humous layers or separate lenses, at places superposed over each other, with charcoal, bones, lithic artefacts and limestone blocs. The inclination grades strongly along the slope, in the western part stepwise according to microtectonic fissures;

4. Grey-to-bluish silts, continuing deeper into the subsoil.

In northern prolongation of the western profile (total length 7.75 m) we documented massive land-sliding that took place between deposition of layers 4/3 and 2 (Fig. 9).

Fig. 9. Dolní Věstonice I, trench 7a/93, extension of the western profile showing massive landslides of the Tertiary silts together with relicts of the Gravettian layer on top and covered by loess. Photo J. Svoboda.

Obr. 9. *Dolní Věstonice I, sonda 7a/93, prolongace západního profilu s masívním sesuvem terciérních slínů, s reliktem gravettské vrstvy na povrchu a překryvem spraší. Foto J. Svoboda.*

3.11. Exterior – Trench 8/90

(dimensions 2,25 × 1.5 m, depth 3.1 m). Archaeologically sterile.

1a. Subrecent refill (0–30 cm);

1b. Holocene black-to-greyish calcareous soil (30–60 cm);

2a. Light grey to ochreous loess with black manganese spots in the lower part, penetrated by vertical fissure with calcareous filling (60–220 cm);

2b. Ochreous loess with bluish and rusty (Fe) spots and sandy admixture (continuing below 220 cm).

3.12. Uppermost part – Trench 9/90

(dimensions 2 × 1.5 m, depth 2 m). A separate lense of cultural layer.

1. Holocene black-to-greyish calcareous soil (0–50 cm);

2. Light grey loess, with black manganese spots in the lower portion (50–150 cm);

3. Cultural layer, here represented as superposition of an undulated rusty (Fe) band above and a charcoal horizon below, both strongly declining downslope (150–200 cm). Jan Novák (pers. comm.) 2017 determined 22 pieces as *Pinus sylvestris* and reconstructs the sorrounding landscape as cold parkland steppe with individual occurrence of pine, especialy in favourable spots.

3.13. Uppermost part – Trench 10/90

This trench (dimensions 2.3 × 1.5 m, depth 3 m) detected the margin of adjacent Klíma´s excavation, 1951–1952 (residential unit K2).

1a. Subrecent clayish refill (0–60 cm);

1b. Relict of a Holocene black-to-greyish calcareous soil (40–60 cm);

2a. Light grey loess penetrated by vertical fissures with calcareous filling (60–160 cm);

2b. Loess, with bluish and black manganeous spots (160–230 cm);

2c. Loess, penetrated by rusty (Fe) bands (230–250 cm);

3. Cultural layer, here represented as two compact charcoal lenses in superposition, with individual limestone blocs and small bones (260–290 cm). The lower charcoal lense was dated: GrN-18189, 25950 +630 -580 BP.

3.14. Exterior – Trench 11/90

(dimensions 2.2 × 1.2 m, depth 3 m). Archaeologically sterile.

1a. Subrecent clayish refill (0–150 cm);

1b. Holocene black-to-greyish calcareous soil (150–210 cm);

2. Light grey loess with dark particles of brownish sediments, penetrated by vertical fissure with calcareous filling (below 210 cm).

3.15. Exterior – Trench 12/90

(dimensions 2.2 × 1.3 m, depth 3.2 m). Archaeologically sterile.

1a. Subrecent clayish refill (0–150 cm);

1b. Holocene black-to-greyish calcareous soil (150–200 cm);

2. Light grey loess, sterile (below 200 cm).

4. C^{14} Dating

The number of available C^{14} dates from site DV I (Tab. 2, Fig. 10) is low compared to other larger sites in the same area (see Svoboda 2016, tab. III. 1). Although Dolní Věstonice was one of the first Czech sites where the C14 dating method was applied (mostly by the Groningen Lab.), major parts of site DV I have

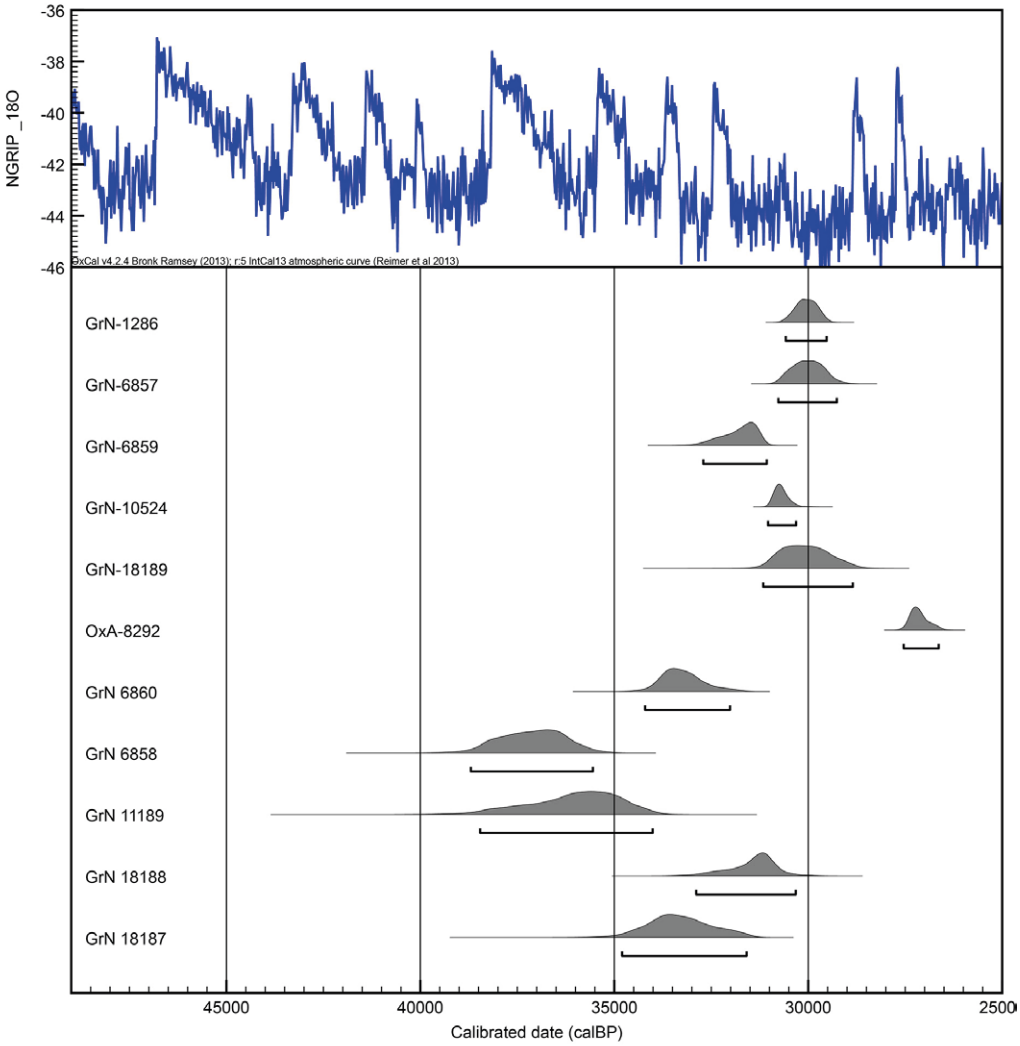


Fig. 10. Dolní Věstonice I, calibration of C^{14} dates. Below: earlier dates (cultural association unclear); above: Evolved Pavlovian dates; later dates omitted (probably contaminated). Graphic M. Novák.

Obr. 10. *Dolní Věstonice I, kalibrace dat C14. Dole: starší data (kulturní kontext nejistý); nahoře: data vyvinutého pavlovienu; pozdější data nejsou uvedena (zřejmě kontaminace). Grafika M. Novák.*

been excavated prior to invention of this method and after that, the measurements were taken at various stages of its technical development.

Earliest series of dates were obtained by Klíma and Haesaerts from the brownish paleosol below the cultural layer (MIS 3), which is usually rich in charcoal, but without traces of human occupation. Majority of these dates originate from the **lower part** of the site. Our excavation in trench 1/90 adds two dates in superposition (GrN-18187-8) but no associated artefacts either, and human presence may be attested in case of the upper one only (due to formal characters of a man-made hearth). Chronological position of the both dates corresponds to the Early Gravettian (34–31 ky BP).

Most of the dates from the **middle and upper parts** lack more precise contextual evidence but as a whole, they indicate the Evolved Gravettian/Pavlovian (31–29.5 ky BP), which accords with the general character of the rich archaeological record.

The new date from the **uppermost part** of the site, trench 10/90 (GrN-18189), corresponds to the Evolved Gravettian/Pavlovian stage as well; because this trench is adjacent to Klíma´s excavation in 1951–52, we relate this date to residential unit K2. The same age is provided by another date (GrN-10524) obtained by Klíma from the unit K3, excavation 1978–1979.

Values more recent than the Pavlovian stage are suspected to be due to contamination during long-term storage and preservation in depositories (human femoral diaphysis DV35, OxA-8292; Trinkaus *et al.* 1999), inadequate pretreatment of the samples in laboratories, or other interventions (Ly data, omitted from Tab. 2). However all of them predate the LGM and thus provide minimal ages of human occupation at site DV I.

5. Paleorelieph, human occupation, and postdepositional processes

Large-scale excavations at Pavlov I and Dolní Věstonice II demonstrate how different was the pre-Gravettian paleorelieph from the actual one, given the extensive landsliding, water erosion, and other processes that have shaped slopes of the Pavlov Hills. In terms of sedimentary material, the original surface was formed by Tertiary silts and marls of various texture and coloration, limestone rubble, and locally by pre-Gravettian loess and paleosols. However, compared to other sites located on the same slope, the effect of landsliding on the archaeological layers at Dolní Věstonice I is larger than elsewhere.

The two series of trenches realised at Dolní Věstonice I, S–N and E–W, demonstrate that in the SW part of the site, the basal landslides reach almost to the actual surface. The Last Glacial loess coverage increases in thickness downslope towards the N (depth of 4–3.6 m in trenches 1–2/90) and towards the E (in trenches 8–12/90 the Tertiary clays were not reached). The maximal thickness of 6 m was reached by Klíma in the water-filled depression with the mammoth bone deposit (Klíma 1969). The preferential location of the Gravettian cultural deposit directly on the redeposited Tertiary silts and below the LGM loess (Klíma 1963; 1983a, etc.) is being confirmed in our trenches 1–2/90 and 7a/93. In the trench 7/90 the Gravettian layer was deposited above earlier soil sediments and in trenches 9–10/90 it overlied thick deposits of pre-Gravettian loess. Outside the settled area we record either loess superposed direcly on the Tertiary silts and marls (trench 3a/90 and 5–6/90) or massive loess deposits, without reaching the bedrock (trenches 8/90 and 11–12/90).

The cultural layer includes particles of anthropogenic origin (charcoal, faunal remains, and artefacts)

Laboratory-number	Excavator	Context	Result (BP)	Deviation	Result (cal BP)	Deviation 2 sigma
GrN-1286	Absolon	1936 area	25,820	170	30,578–29,527	95.4
OxA-8292	Absolon	1930 area? fossil DV35	22,840	200	27,537–26,637	95.4
GrN-6857	Klíma	cultural layer	25,790	320	30,770–29,263	95.4
GrN-6859	Klíma	below the cultural layer	27,790	370	32,705–31,070	95.4
GrN-6860	Klíma	brown paleosol	29,180	460	34,205–32,016	95.4
GrN-6858	Klíma	brown paleosol	32,850	660	38,698–35,551	95.4
GrN-11189	Klíma	cultural layer	31,700	1000	38,459–34,010	95.4
GrN-10524	Klíma	unit K3	26,430	190	31,035–30,314	95.4
GrN-18189	Svoboda	10/90 – unit K2	25,950	+630 -580	30,550–29,865	95.4
GrN-18188	Svoboda	1/90 – hearth	27,250	+590 -550	31,315–31,025	95.4
GrN-18187	Svoboda	1/90 – paleosol	29,300	+750 -690	33,761–33,385	95.4

Tab. 2. Dolní Věstonice I, survey of C14 datings, calibration using OxCal 4.3. (4.1.2018).
Tab. 2. *Dolní Věstonice I, přehled datací C14, kalibrace podle OxCal 4.3. (4.1.2018).*

and features (hearths). At places (trench 7a/93; 10/90) thin layers of anthropogenic deposits are superposed over each other and create an archaeological microstratigraphy. The presented sections also demonstrate that various deformations of the cultural layer (layers), be it frost and slope processes creating a texture with separate lenses, microtectonic fissures, and discrete landsliding (Fig. 9), took places **after** the human occupation and **before** deposition of the LGM loess.

This paleosurface, structured into elevations and gullies leading downslope, was leveled into a gentle slope by massive eolian deposition during the LGM. Therefore, thickness and composition of the loess differs at various sites and sub-sites of the area. Loess disappears totally in the SW part where Tertiary silts occur on the surface, and increases in thickness towards the north and east. In the lower (northern) part of the site Dolní Věstonice I (trenches 1-2/90), the loess accumulation is interstratified by numerous sandy horizons and lenses. In the uppermost part of the site (trenches 8–12/90) the loess changes gradually in colour and texture being light and calcareous in the upper portion (2a), turning to ochreous with black (Mn) spots or rusty (Fe) coating (2b), and showing gleyification effects at the base of the sections. The number of the recorded gley horizons within the loess was lower in our trenches compared to complex sequences recovered in the mammoth bone deposit (Klíma 1969; 1995a) or elsewhere at Pavlov I and DV II (Svoboda 2016).

Disturbances from various prehistoric/protohistoric features were recorded in trenches 5/90, 6a/90, 7/90 and 7a/93. Finally, the surface was leveled by agricultural cultivation, until the last recultivation in 2016.

6. Archaeological planigraphy

As in other Gravettian sites of the Pavlov Hills area, the basic element of our analysis represents a discrete unit, ideally with a central hearth, or other visible concentration of features and objects. According to the excavator´s initials we labeled Absolon´s units as "A" and Klíma´s as "K", leaving the original numeration sequence as originally was (Svoboda 2016). Given the limited spatial extend of the 1990 and 1993 trenches, we have little to add to the overall site structure at DV I, but rather concentrate on site peripheries in the lower and uppermost parts of the site.

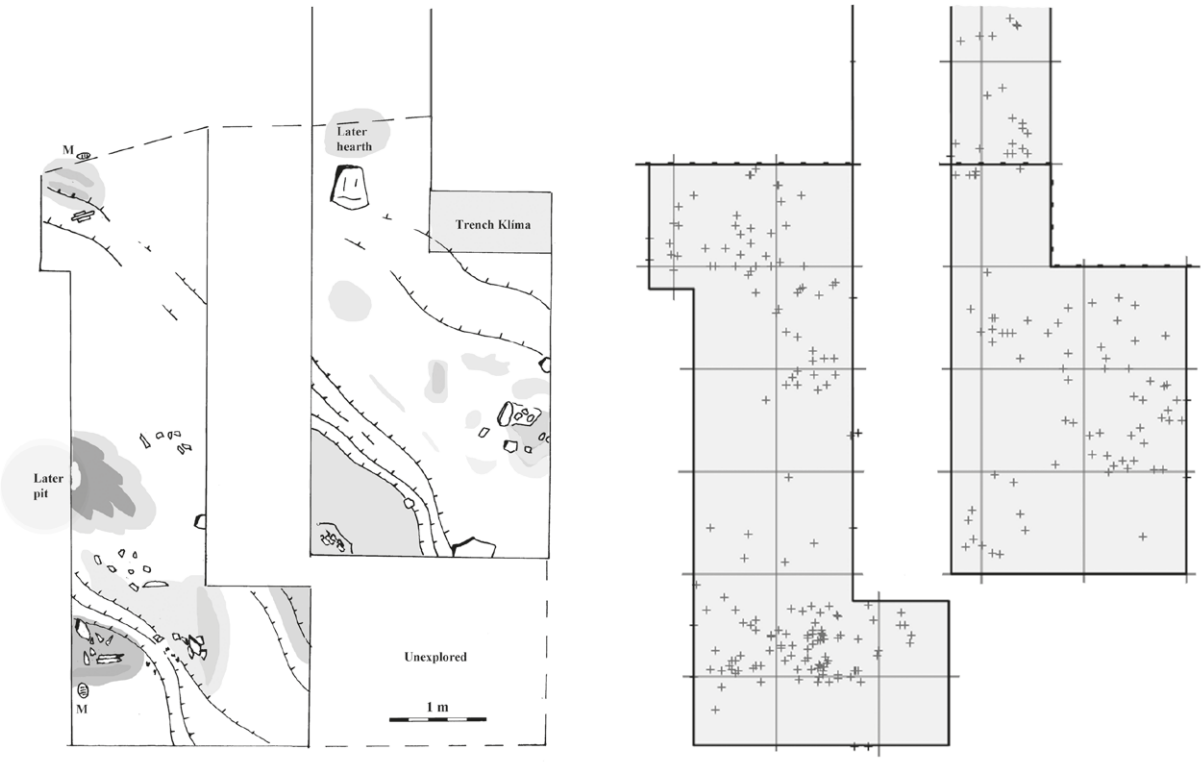


Fig. 11. Dolní Věstonice I, trench 7a/93. Left: plan of the excavated surface. Right: distribution of lithic artefacts. Graphic J. Svoboda and P. Škrdla.

Obr. 11. *Dolní Věstonice I, sonda 7a/93. Vlevo: plán prozkoumaného povrchu. Vpravo: distribuce kamenných artefaktů. Grafika J. Svoboda a P. Škrdla.*

6.1. Lower part

Only two of the charcoal deposits detected by our excavation (trench 1/90 – upper location and 2/90) associated to red-burnt clay and a few limestone blocs may be interpreted as structured hearths. As they were not excavated completely (given the size and depth of trenches 1–2/90) and both were affected postdepositionally, their diameter may only be estimated around 0.75m. No artefacts and only one bone fragment were recovered from these contexts.

6.2. The uppermost part

The largest area opened in trench 7a/93 shows the structure of living floors and features more clearly (Fig. 11). Two years later this situation was presented to participants of the ESF Network *Paleolithic Occupation of Europe*, 1995 (Gamble 1999, fig. 7.9). Lithic distribution was recorded 3-dimensionally and the sediment wet-sieved. In the NE corner the trench detected boundary of Klíma´s 1978–1979 excavation with a complex hearth in the western part (residential unit K3, interpreted by him as an "oven"; Klíma 1980a, b; 1981b; 1983a, b). Although we were able to detect the trench boundaries in the field, the partial plan of the central hearth (Klíma 1983a, fig. 20) does not allow us to join the both areas into a unique plan. Nevertheless we may state that the trench 7a/93 forms a periphery of an important instalation where the unique cultural layer turns into a complex of separate lenses. As we proceeded southwards against the slope, these lenses, originally in a shallow position below the surface, continued below a massive deposits of loess and subrecent refill. We recovered a paleorelieph strongly declining from SW towards NE. At places the slope grades stepwise according to the microtectonic fissures. Structured hearths or pits were absent. Discrete artefact accumulations or individual lenses composed of charcoal and animal bones were dispersed on leveled surfaces, especially in higher parts of the trench where the structuration results from postdepositional processes rather than human activity.

Western and eastern sections in the 7a/93 trench show how the cultural layer was postdepositionaly affected by frost processes and microtectonics. The prolongation of western section documents a massive landsliding of Tertiary silts together with relicts of the cultural layer on top (Fig. 9). As already observed by Klíma (1983a), at certain places the landsliding elevated cultural layers towards the surface where it was destroyed by ploughing. In addition, relicts of an undated prehistoric feature with a hearth disturbed this situation at the northern edge next to the road and a protohistoric (La Tène?) pit was hollowed in trench 7a/93 – western section as deep as the Paleolithic layer (Fig. 8 left). Final modification of this terrain are due to construction of the actual road and vineyard.

In trench 9/90 we excavated a thin humous and charcoal lense in otherwise sterile loess, with a discrete artefact concentration, showing a strong inclination upslope. Trench 10/90 provided thin charcoal layers in direct contact with Klíma´s 1951–1952 excavation (residential unit K2; Klíma 1963).

7. Quaternary fauna

Previous studies (Musil 1958; Wertz *et al*. 2016; Wilczynski *et al*. 2015) presented the faunal composition at site DV I as a whole, with the exception of the large mammoth bone deposit with strongest mammoth dominance (Klíma 1969). There is little evidence about the variability in faunal composition inside the settlement. Musil (1958, 79) noted slight variation between assemblages of units K1 (upper part of the site) dominated by fox and hare against K2 with prevailing wolf and reindeer, but sequence of the other species was similar.

Although material from the 1990–1993 excavation is not numerous, it enables some comparisons among various parts of the site. We analysed faunal materials from the lower part (an undeterminable bone), middle part (Absolon´s discard) and especially from the uppermost part, associated to Klíma´s units K2 and K3.

7.1. Trench 2/90

yielded only one piece of indeterminate bone fragment (3–5 cm) weathered at stage III–IV (accordings to Behrensmeyer 1978).

7.2. Trench 3/90

included total of 266 bone and teeth fragments of which 18,04% are possible to be taxonomically determined. The skeletal parts of woolly mammoth (*Mammuthus primigenius*; NISP = 28; MNI = 1) contain fragments of tusk, molar lamellae, possible distal part of humerus and several anatomically indeterminate bone fragments. Other two taxa represent by horse (*Equus ferus*; NISP = 19; MNI = 1) with several incisor fragments and proximal half of third left metatarsal; and wolf (*Canis lupus*; NISP = 1; MNI = 1) with left astragalus. Some of the fragments are weathered at stage IV–V or heavily etched by plant roots, which causes corrosive destruction on the surface of these pieces. Pinky to red color produces iron oxide concretions (for earlier observation see Zázvorka 1951; Klíma 1983a).

7.3. Trenches 7/90–93

yielded 671 bone and teeth fragments of which several animal species is possible to determined (31,43%), such as woolly mammoth (*Mammuthus primigenius*; NISP = 193, MNI = 1) represented by fragments of skull, molar lamellae, vertebral and rib fragments, and several closely indeterminate long bone fragments or pieces of spongy bone. Horse (*Equus ferus*; NISP = 11, MNI = 1) is characterized by upper and lower molar/premolar fragments and second phalang; and the wooly rhinoceros (*Coelodonta antiquitatis*; NISP = 2, MNI = 1) by a long bone fragment. The maximal horse phalang length with its 55,0? mm slightly oversized interval 45.4–54.0 mm measured on ph II by R. Musil (1959) at this site. Bones and teeth are weathered at stage II–III and their surface display slight to heavy modification after plant roots; several bones were covered with iron oxide concretions in pink, red to brown color. We observed several traces after human activities, namely of burning (with prevalence of stages I–III) and chipping on two large sized mammal bone fragment, however we cannot exclude trampling or other taphonomic activities in this case.

7.4. Trench 9/90

provided 109 bone and teeth fragments of which only two tusk fragments and one molar lamellae belong to wooly mammoth. Several other bones display traces after root etching and three of them are covered with iron oxide concretion.

7.5. Trench 10/90

yielded 116 bone and teeth fragments, of which the most representative species are the woolly mammoth (NISP = 46, MNI = 1) with molar lamellae fragments, fox (*Vulpes vulpes/Vulpes lagopus*; NISP = 8, MNI = 1) with fragment of left pelvic bone, four metapodial fragments, fragment of left calcaneus (25.0–28.6 mm; 31.8 and 35.4 mm) and two first phalanges; and wolf (NISP = 1, MNI = 1) with possible phalang fragment. Both trenches 9 and 10 contained nearly 100 burned bone fragments (with prevalence of stages IV–V).

7.6. In total,

the newly excavated samples display higher amount of burned bone fragments (NISP = 346; Fig. 12–13) compared to earlier material of Absolon and Klíma (NISP = 142; Wilczynski *et al.* 2015). Looking at Absolon´s discard in our trench 3/90, the expected amount of burned bones in the earlier digs should have been 3.6× higher. We conclude therefore that unburned osteological material was collected preferentially during the earlier excavations.

In contrast to Wilczynski *et al.* (2015) we observed no cut marks in the 1990–1993 assemblage.

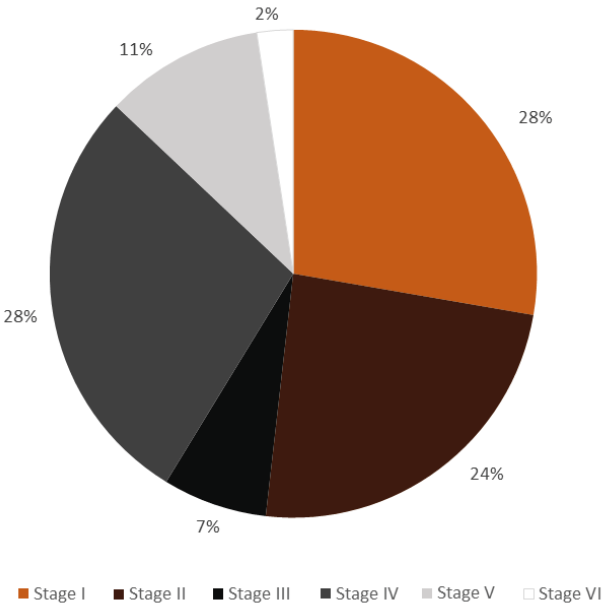


Fig. 12. Dolní Věstonice I. Distribution of bones based on stages of burning (stage I – less than 50% of organic compound carbonized; stage II – more than 50% of organic compound carbonized; stage III – organic compound fully carbonized; stage IV – less than 50% of organic compound oxidized; stage V – more than 50% of organic compound oxidized; stage VI – organic compound fully oxidized). Graphic S. Sázelová.

Obr. 12. *Distribuce kostí vzhledem ke stupni spálení (stádium I – karbonizováno méně než 50 % organické složky; stádium II – karbonizováno více než 50 % organické složky; stádium III – organická složka plně karbonizována; stádium IV – oxidováno méně než 50 % organické složky; stádium V – oxidováno více než 50 % organické složky; stádium VI – organická složka plně oxidována). Grafika S. Sázelová.*

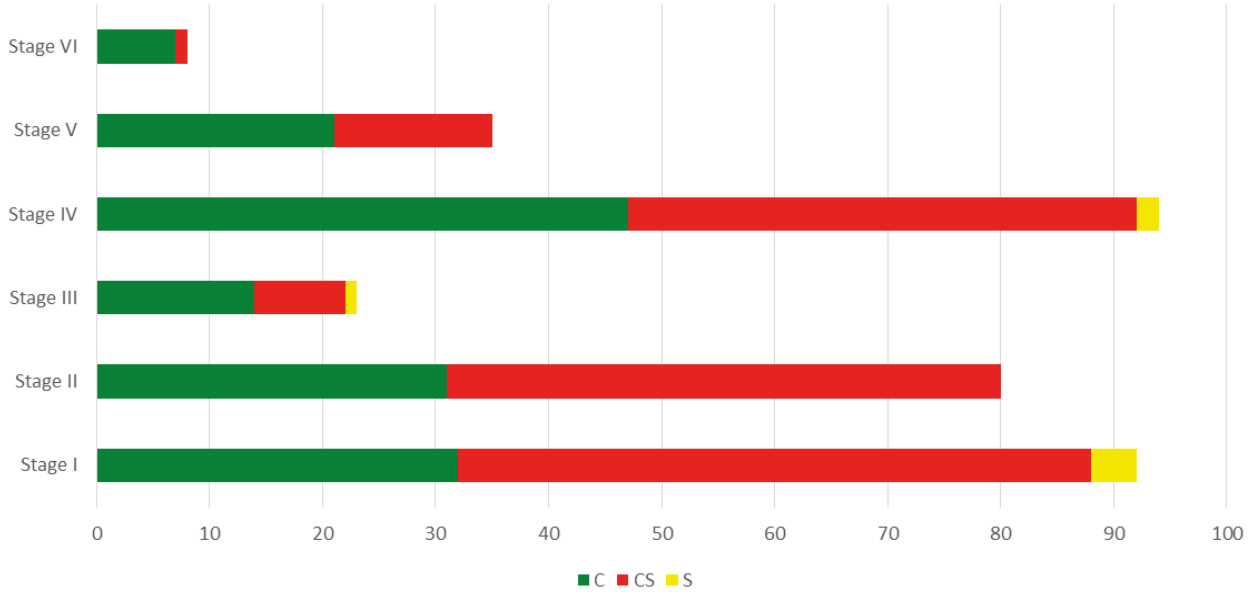


Fig. 13. Dolní Věstonice I. Distribution of bone types (c – compact bone, cs – compact/spongy bone, s – spongy bone) according to stages of burning. Percentual d. Graphic S. Sázelová.
Obr. 13. *Dolní Věstonice I. Distribuce typů kostí (c – kompakta, cs – kompakta/spongióza, s – spongióza) podle stupně spálení. Percentuelní d. Grafika S. Sázelová.*

	Trench 3/90				Trench 7/90–93			
taxon	NISP	%NISP	MNE	%MNE	NISP	%NISP	MNE	%MNE
Mammuthus primigenius	28	58.33	28	82.35	193	94.6	187	95.40
cf. *Coelodonta antiquitatis*	0	0	0	0	2	0.98	1	0.51
Equus ferus	19	39.58	5	14.70	11	5.39	9	4.59
Canis lupus	1	2.08	1	2.94	0	0	0	0
Vulpes vulpes/Vulpes lagopus	0	0	0	0	0	0	0	0
Subtotal	**48**	**18.04**	**34**	**13.60**	**204**	**31.43**	**196**	**30.87**
extra-large sized mammal	4	1.83	4	1.85	25	5.62	23	5.24
large to extra-large sized mammal	1	0.46	1	0.46	21	4.72	19	4.33
large sized mammal	8	3.67	8	3.70	9	2.02	6	1.37
middle to large sized mammal	6	2.75	6	2.78	11	2.47	11	2.50
middle sized mammal	9	4.13	7	3.24	13	2.92	12	2.73
small to middle sized mammal	0	0	0	0	0	0	0	0
small sized mammal	2	0.92	2	0.92	4	0.90	4	0.91
indeterminate	188	86.24	188	87.03	382	85.84	382	87.01
Subtotal	**218**	**81.95**	**216**	**86.40**	**445**	**68.57**	**439**	**69.13**
Total	**266**	**100.00**	**250**	**100.00**	**649**	**100.00**	**635**	**100.00**

Tab. 3a. Distribution of animal species at Dolní Věstonice I – trenches 3/90 and 7/90–93; quantification by NISP = Number of identified species and MNE = Minimal number of skeletal elements.
Tab. 3a. *Distribuce druhů zvířat v Dolních Věstonicích I – sondy 3/90 a 7/90–93; kvantifikace podle NISP = počet určených druhů a MNE = minimální počet skeletálních částí.*

	Trench 9/90				Trench 10/90			
taxon	NISP	%NISP	MNE	%MNE	NISP	%NISP	MNE	%MNE
Mammuthus primigenius	3	100.00	2	100.00	46	83.63	46	83.63
cf. *Coelodonta antiquitatis*	0	0	0	0	0	0	0	0
Equus ferus	0	0	0	0	0	0	0	0
Canis lupus	0	0	0	0	1	1.81	1	1.81
Vulpes vulpes/Vulpes lagopus	0	0	0	0	8	14.54	8	14.54
Subtotal	**3**	**2.75**	**2**	**1.98**	**55**	**47.41**	**55**	**47.41**
extra-large sized mammal	0	0	0	0	0	0	0	0
large to extra-large sized mammal	0	0	0	0	0	0	0	0
large sized mammal	0	0	0	0	0	0	0	0
middle to large sized mammal	1	0.92	1	0.99	0	0	0	0
middle sized mammal	3	2.75	1	0.99	1	1.64	1	1.64
small to middle sized mammal	4	3.67	2	1.98	0	0	0	0
small sized mammal	4	3.67	3	2.97	9	14.75	9	14.75
indeterminate	94	86.23	94	93.07	51	83.61	51	83.61
Subtotal	**106**	**97.24**	**101**	**98.06**	**61**	**52.58**	**61**	**52.58**
Total	**109**	**100.00**	**103**	**100.00**	**116**	**100.00**	**116**	**100.00**

Tab. 3b. Distribution of animal species at Dolní Věstonice I – trenches 9/90 and 10/90; quantification by NISP = Number of identified species and MNE = Minimal number of skeletal elements.

Tab. 3b. *Distribuce druhů zvířat v Dolních Věstonicích I – sondy 9/90 a 10/90; kvantifikace podle NISP = počet určených druhů a MNE = minimální počet skeletálních částí.*

	Dolní Věstonice I				Dolní Věstonice II	
	Trench 3	Trench 7	Trench 9	Trench 10	Southern edge	
taxon	NISP/MNE	NISP/MNE	NISP/MNE	NISP/MNE	NISP/MNE	NISP/MNE$_{corr}$
Mammuthus primigenius	1.000	1.032	1.500	1.000	1.003	183.333
cf. *Coelodonta antiquitatis*	0.000	2.000	0.000	0.000	0.000	0.000
Rangifer tarandus	0.000	0.000	0.000	0.000	1.521	1.521
Cervidae	0.000	0.000	0.000	0.000	23,000	23.000
Equus ferus	3.800	1.222	0.000	0.000	0.000	0.000
Panthera leo spelea	0.000	0.000	0.000	0.000	1.000	1.000
Canis lupus	1.000	0.000	0.000	1.000	2.000	2.000
Vulpes vulpes/Vulpes lagopus	0.000	0.000	0.000	1.000	1.000	1.000
Canidae	0.000	0.000	0.000	0.000	1.333	1.333
Lepus, sp.	0.000	0.000	0.000	0.000	3.000	3.000
Subtotal	**1.411**	**1.041**	**1.500**	**1.000**	**1.093**	**28.791**
extra large sized mammal	1.000	1.087	0.000	0.000	0.000	0.000
large to extra large sized mammal	1.000	1.105	0.000	0.000	5.667	5.667
large sized mammal	1.000	1.500	0.000	0.000	1.000	1.000
middle to large sized mammal	1.000	1.000	1.000	0.000	1.000	1.000
middle sized mammal	1.286	1.083	3.000	1.000	1.089	1.089
small to middle sized mammal	0.000	0.000	2.000	0.000	1.667	1.667
small sized mammal	1.286	1.000	1.333	1.000	1.667	1.667
indeterminate	1.286	1.000	1.000	1.000	1.001	1.001
Subtotal	**1.001**	**1.014**	**1.049**	**1.000**	**1.009**	**1.009**
Total	**1.064**	**1.022**	**1.058**	**1.000**	**1.035**	**1.466**

Tab. 4. Index of osteological material fragmentarization (NISP/MNE) at perifery of Dolní Věstonice I (trenches 3/90–10/90) and Dolní Věstonice II S7 (Southern edge) sites. NISP = Number of identified species; MNE = Minimal number of skeletal elements; NISP/MNE$_{corr}$ = index of fragmentarization (modified for central tusk parts).

Tab. 4. *Index fragmentace osteologického materiálu (NISP/MNE) na periferii lokality DV I (sondy 3/90–10/90) a DV II (Jižní okraj). NISP = počet určených druhů; MNE = minimální počet skeletálních částí; NISP/MNE$_{corr}$ = index fragmentace (modifikováno na středové části klu).*

8. Pre-Quaternary fossils

As in the other Gravettian assemblages, the material includes numerous fossils of pre-Quaternary origin. Three new paleontological specimens have been recorded from various trenches in the uppermost part of site DV.

One **crinoid stem fragment** (4 connected ossicles, order Millericrinida) originates from trench 7a. An uncomplete large **echinoid spine** of the species *Hemicidaris (Sphaerotiaris)* sp. has been found in trench 9. Both of the mentioned specimens are no doubt of Mesozoic (Jurassic) age and of local origin, coming most probably directly from the Mesozoic rocks (Ernstbrunn Limestone and Klentnice beds) of the Pavlovian Hills (Kimmeridgian–Berriasian, e.g. Upper Jurassic–Lower Cretaceous). Particularly in the Klentnice beds both hemicidarid spines and stem fragments of millericrinid crinoids represent common echinoderm fossils (Schneider *et al.* 2013).

In trench 7 one fragment of the tubular **shell of a serpulid worm** (*Protula* sp.) has been found. It is of Miocene (most probably of Badenian) age and comes evidently from the Miocene sediments of the Carpathian Foredeep and/or Vienna Basin outcropping closely to the DV I Gravettian site.

Unlike the Miocene serpulids, specimens of Mesozoic echinoderms represent rather a rarity within fossils of invertebrates discovered up to now at Gravettian localities of Pavlov Hills (Klíma 1963, tab. 69, 923–931; Hladilová 2016). For the Gravettians they represented attractive but rather accidental finds, and they do not manifest traces of human manipulations.

9. Lithic artefacts

The lithic industry unearthed during the 1990 and 1993 excavations consist a total of 568 pieces from four separate contexts: trench 3/90 from the middle part of the site (Absolon's discard) and several trenches (7/90, 7a/93, 7b/93, 9/90 and 10/90) in the uppermost part, near the previously excavated units K2 and K3. Trenches 7, 7a and 7b are analyzed together as one assemblage 7/90–93.

A summary overview of the discussed assemblages, which differ in quantity, quality and overall character, is presented in the table 5. The richest assemblage originates from the 7/90–93 excavation area (79% of all lithics) and a higher quantity of lithics was also recorded in trench 9/90 (15% of all lithics). Others assemblages (trench 3/90 and 10/90) yielded only a small number of artefacts. In all assemblages, the most numerous items are small chips, flakes (less 1 cm) and irregular fragments, followed by the group of blanks, retouched pieces and waste from their production, and cores.

The raw material analyses (Fig. 14; Tab. 6), based on macroscopic determination, shows that the raw material composition is most diverse in the largest 7/90–93 assemblage while the other assemblages are more uniform.

Extralocal patinated silicites compose more than 2/3 of all pieces in all assemblages. Nearly all of them are usually strongly patinated, with bluish-white colored patina, as is usual within the wide variety of "erratic flints" from glacial and glaciofluvial deposits, with the closest sources in northern Moravia, Silesia and southern Poland (Přichystal 2009). In the 7/90–93 excavation area, there were also found 4 pieces of flint of the Krakow Jurassic type (variety A), with primary sources in the area of the Krakow-Czestochowa highlands and secondary deposits in glacial sediments of southern Poland (Přichystal 2009). Compared to the erratic flints, they differ in the patina, which is mostly greyish-beige. One crested blade, completely unpatinated, displays a brown semi-transparent matrix/mass and rough cortex of rusty and dark brown coloring.

Flints are followed by the radiolarite, even though with a higher abundance only in the 7/90–93 assemblage (6,2%); in the other assemblages its proportion is minimal or nonne. Radiolarite represents another extralocal material. The artefacts are mostly without preserved cortex. According to matrix macroscopy, mostly of greenish and reddish-brown hues, they could originate from the primary sources in the Carpathian Klippen Belt in Slovakia and due to coloration of some pieces (yellowish-brown or dark-gray), Austrian outcrops may also be considered.

Other raw materials were found only in the 7/90–93 assemblages and they are represented by cherts, spongolite and quartzite. The cherts are macroscopically similar to cherts of Krumlovský les type, with non-transparent, bluish light-gray color of matrix and a typical black cortex preserved on some parts on the surface. Artefacts made of spongolites or spongolitic cherts display a semi-transparent, honey brown color of matrix with a hint of white patina on surface. The both raw materials are probably local, originating from the Pleistocene sandy-gravel fluvial sediments of the Dyje River.

Heavy-duty industry was nearly completely made from quartzes of different color varieties ranging from white, yellowish and reddish to gray-black, and probably of local provenience. One wide, plain flake was made of a fine grained light-grey sandstone pebble.

Approximatively 15% of the assemblages remains undetermined mostly due to intensive burning. However, the majority of these pieces are macroscopically also similar to flints.

	3/90		7/90–93		9/90		10/90		Total	
	N	%	N	%	N	%	N	%	N	%
Cores	1	12.5	19	4.2	1	1.2	0	0.0	21	3.7
Non-retouched pieces	5	62.5	328	72.9	69	82.1	24	92.3	427	75.2
Retouched artefacts	1	12.5	69	15.3	11	13.1	0	0.0	81	14.3
Tool production waste	0	0.0	16	3.6	3	3.6	2	7.7	21	3.7
Heavy-duty industry	1	12.5	18	4.0	0	0.0	0	0.0	18	3.2
Total	**8**	**100**	**450**	**100**	**84**	**100**	**26**	**100**	**568**	**100**

Tab. 5. Dolní Věstonice I. General composition of lithic artefacts in the individual analyzed assemblages according to the trenches.

Tab. 5. *Dolní Věstonice I. Celková skladba kamenných artefaktů v analyzovaných souborech podle sond.*

	3/90		7/90–93		9/90		10/90	
	N	%	N	%	N	%	N	%
Flint	5	62.5	311	69.1	72	85.7	22	84.6
Radiolarite	1	12.5	28	6.2	1	1.2	0	0.0
Chert (Krumlovský les type)	1	12.5	5	1.1	0	0.0	0	0.0
Spongolite	0	0.0	6	1.3	0	0.0	0	0.0
Silicite undeterm./Burnt	0	0.0	79	17.6	11	13.1	4	15.4
Other	1	12.5	21	4.7	0	0.0	0	0.0
Total	**8**	**100**	**450**	**100**	**84**	**100**	**26**	**100**

Tab. 6. Dolní Věstonice I. The raw material composition in the analyzed lithic assemblages.

Tab. 6. *Dolní Věstonice I. Surovinová skladba analyzovaných souborů.*

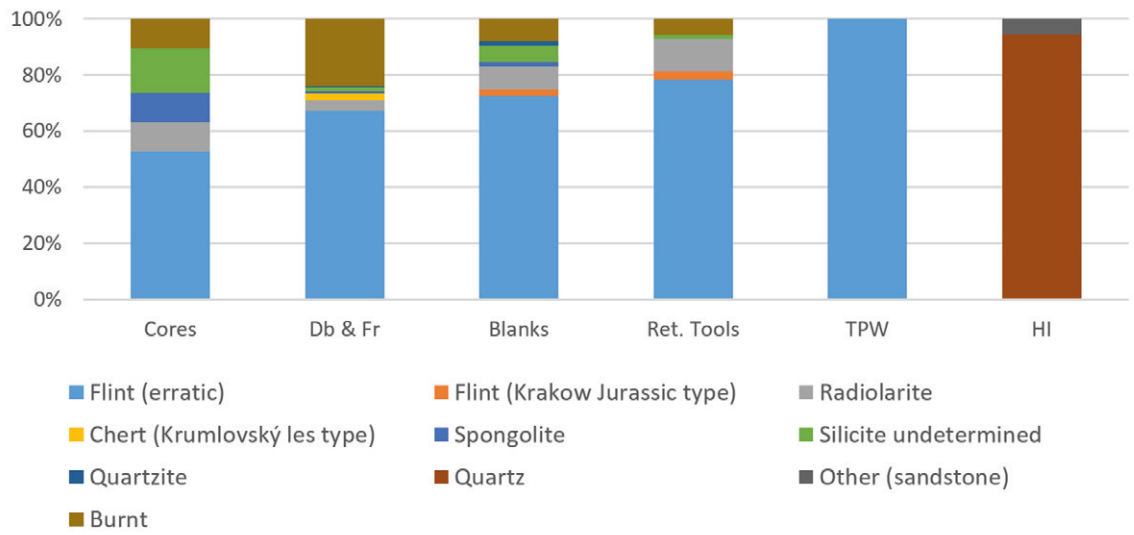


Fig. 14. Dolní Věstonice I – 7/90–93 excavation area. Raw material composition in major technological groups. Graphic M. Novák.

Obr. 14. *Dolní Věstonice I, prostor 7/90–93. Skladba kamenných surovin v hlavních technologických skupinách. Grafika M. Novák.*

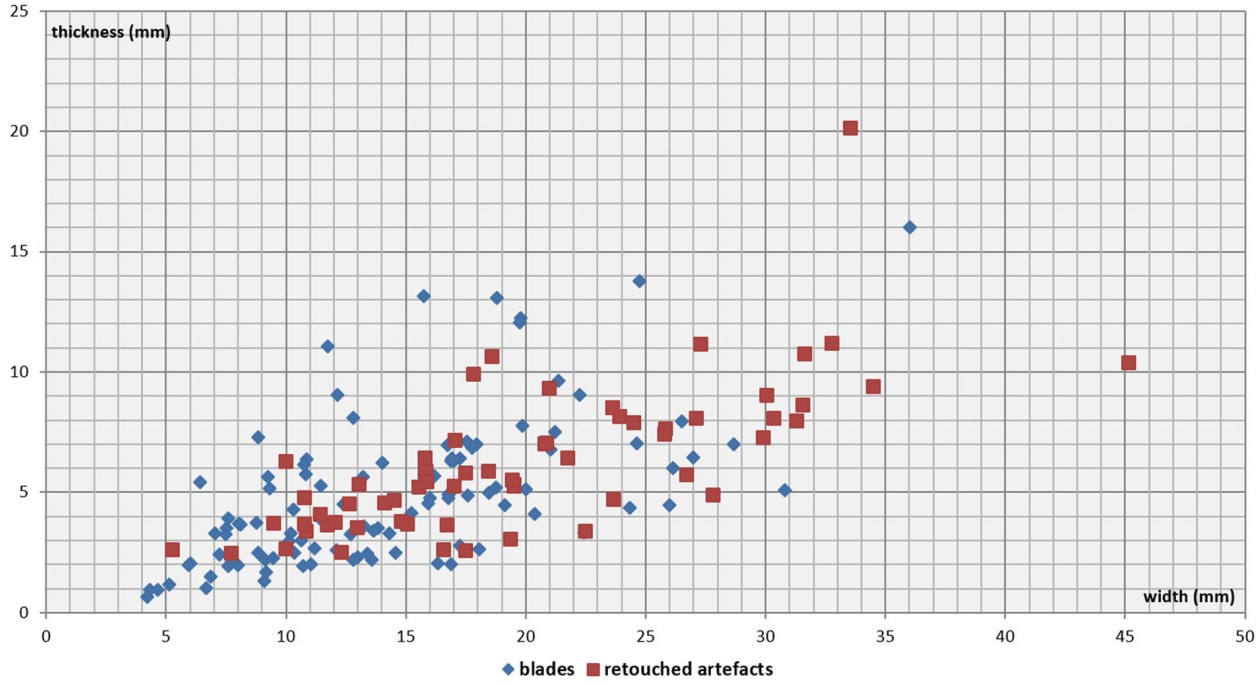


Fig. 15. Dolní Věstonice I – 7/90–93 excavation area. The morphometry of blades and retouched artefacts – mutual relation between the width and the thickness. Graphic M. Novák.

Obr. 15. *Dolní Věstonice I, prostor 7/90–93. Morfometrie čepelí a retušovaných artefaktů – vztah šířka a tloušťka. Grafika M. Novák.*

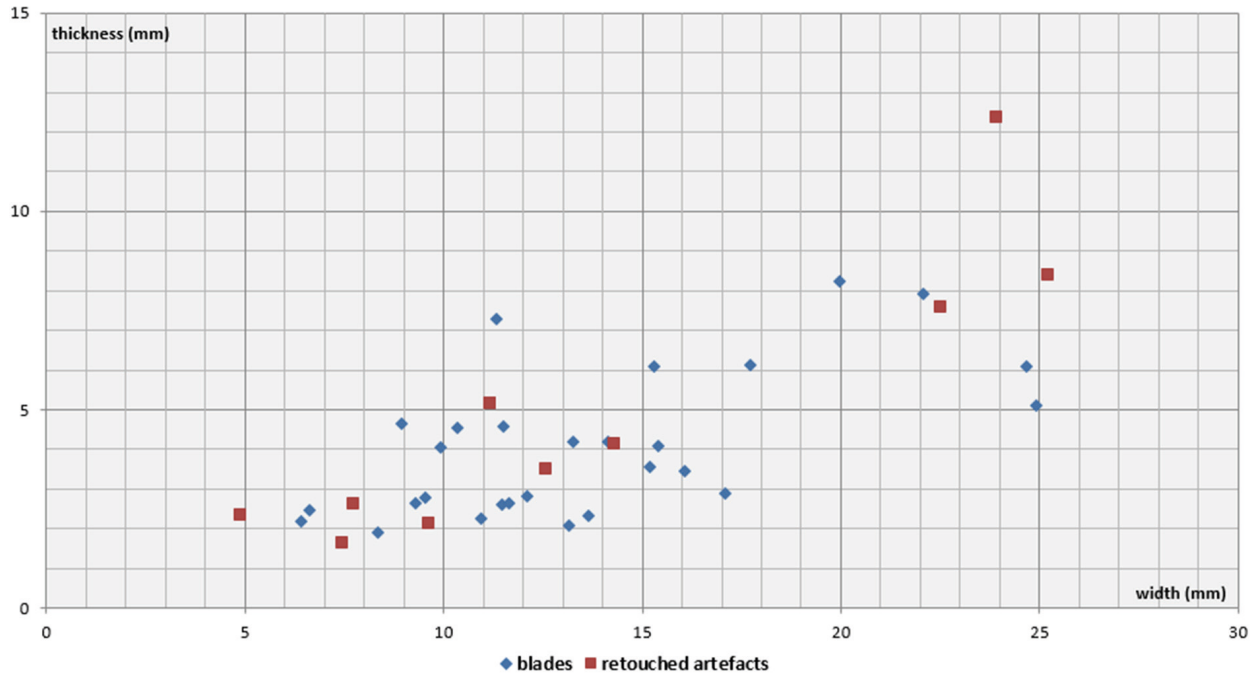


Fig. 16. Dolní Věstonice I – trench 9/93. The morphometry of blades and retouched artefacts – mutual relation between the width and the thickness. Graphic M. Novák.

Obr. 16. *Dolní Věstonice I, sonda 9/93. Morfometrie čepelí a retušovaných artefaktů – vztah šířka a tloušťka. Grafika M. Novák.*

9.1. Trench 3/90

This assemblage consists of 8 lithic artefacts, probably discard from Absolon´s excavation.

A single-platform core was made on rough flake from erratic flint and reminds morphologically a burin-like artefacts, as commonly represented in others collections of DV I lithic industry (Absolon 1945; Klíma 1963). It is completely unpatinated, laterally with preserved cortex, with two parallel blade negatives (width up to 8 mm) and facetted striking platform. It was intended for microblade production and abandoned in residual state.

The blanks are represented by two reparation flakes with length up to 20 mm, removed during the process of core maintenance, and three fragments of blades technologically belonging to *"plein débitage"*. They are two mesial parts and one proximal-mesial fragment, where the punctiform butt with traces of abrasion and a weak, diffuse bulb indicate the use of stone-hammer percussion. The pieces have triangular, trapezoidal and polygonal cross section with length from 18 to 25 mm, width from 10 to 17 mm, and thickness from 3.5 to 4.5 mm.

There were no curated tools except one proximal-mesial fragment of partially retouched blade from reddish radiolarite. The blade is of *"plein débitage"* and was knapped from single-platform core using of organic percussion (according to plain butt with a lip and no visible point of percussion). A weak, small retouch is discontinuously situated on both lateral divergent edges, probably from hafting.

Heavy-duty industry is represented by one rough flake of yellowish quartz pebble.

9.2. Trenches 7/90–93

A total of 450 stone artefacts, including 432 pieces of knapped lithic industry and 18 pieces of non-silicite heavy-duty artefacts, were recovered from the 7/90–93 excavated area located in the surroundings of the Klíma´s unit K3 from the excavation in 1978–1979. The excavation in 1990 (trench 7/90) yielded total of 65 lithics and the collection from trench 7a/93 numbers together 343 lithics, including 3D inventorized artefacts (257 pieces) and artefacts obtained during the wet-sieving of cultural layer sediments (86 pieces). Additional 41 artefacts originate from trench 7b/93, while trenches 7c and 7d provided no artefacts. This collection is complemented by 2 reddish brown lumps of mineral dye and 22 pieces of small sized quartz pebbles and their fragments without traces of human modification.

The group of heavy-duty industry is predominantly composed of morphologically various flakes, irregular shatters and fragments of quartz pebbles with a size from 30 to 56 mm in length. One single-platform core, with faceted platform and an evident flake negative, and one burin-like artefact made on rough blade by a single-blow on the proximal end (or negative scar of hafting?) are also presented. The collection is supplemented by a thin fragment or flake of a fine-grained sandstone plate with naturally smoothed surface of dorsal side.

Technological analysis of knapped industry includes all major technological groups (Tab. 5) and suggests an exploitation of the blade/microblade blanks from cores of extralocal erratic flints, rarely supplemented by radiolarite and others raw materials (Tab. 6), and a subsequent production of tools from them.

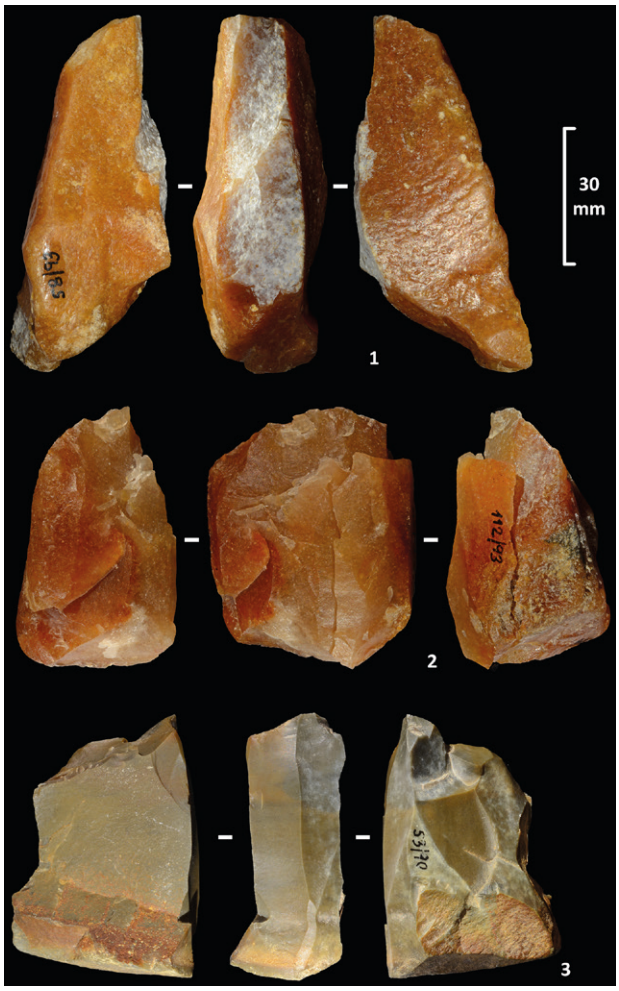


Fig. 17. Dolní Věstonice I – 7/90–93 excavation area. Single-platform cores. Photo M. Novák.

Obr. 17. *Dolní Věstonice I, prostor 7/90–93. Jednopodstavová jádra. Foto M. Novák.*

	IS	AS	RS	Und.	Total
Single-platform	1	3	-	1	**5**
Single-platform on flakes	-	3	2	3	**8**
Double-platform	-	2	-	-	**2**
Double-platform on flakes	-	1	1	-	**2**
Core fragments	-	-	1	1	**2**
Total	**1**	**9**	**4**	**5**	**19**

Tab. 7. Dolní Věstonice I – 7/90–93 excavation area. Composition of individual core types according to the reduction phases. Legend: IS – initial stage of reduction, AS – advanced stage, RS – exhausted residual pieces, Und. – closely undetermined pieces (AS/RS).

Tab. 7. *Dolní Věstonice I – prostor 7/90–93. Skladba typů jader podle stupňů redukce. IS – počáteční stupeň; AS – pokročilý stupeň; RS – vytěžená rezidua; Und. – blíže neurčeno (AS/RS).*

The cores are represented by 19 pieces, mostly abandoned in the advanced reduction stage (9 pieces). The 4 cores represent small exhausted residual pieces and additional 5 cores remain closely undetermined and unclear between advanced and residual stage. No pre-cores or unmodified blocks of raw material were found. Only one core is in the initial reduction stage: a prismatic single-platform type with three blade negatives on the narrow flaking surface and showing no additional modification of its edges or back (Fig. 17: 1). This core was made from spongolite and abandonment at early stage of knapping could support the hypothesis of testing the suitability of this raw material at the DV I site (cf. Oliva 2007, 29).

The cores are generally of small dimensions and microlithic forms, intended mainly for the production of microblades. The core length values range from 18 to 78 mm, however the majority of cores range between 24–36 mm, the width varies from 11 to 51 mm, most frequently between 11–28 mm, and the thickness is from 15 to 36 mm.

Generally, the character of cores corresponds with cores found at DV I site previously (cf. Klíma 1963; Klíma 1980a, fig. 2: 8, 16, 17; Oliva 2007, fig. 12–14).

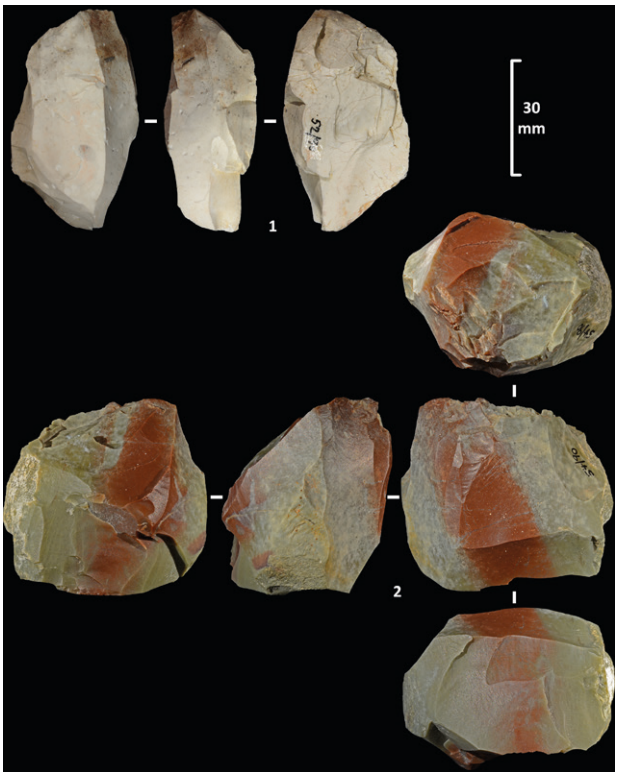


Fig. 18. Dolní Věstonice I – 7/90–93 excavation area. Double-platform cores. Photo M. Novák.

Obr. 18. *Dolní Věstonice I, prostor 7/90–93. Dvoupodstavová jádra. Foto M. Novák.*

Fig. 19. Dolní Věstonice I – 7/90–93 excavation area. Microcores. Photo M. Novák.

Obr. 19. *Dolní Věstonice I, prostor 7/90–93. Mikrojádra. Foto M. Novák.*

Single-platform cores predominate (13 pieces; Fig. 17), supplemented by 4 double-platform types (Fig. 18), usually with two opposite striking platforms situated on same or alternate face, and in one case in mutual perpendicular directions. Typologically significative (10 pieces) are mainly narrow flat micro-cores, made on thicker flakes and morphologically resembling a burin-like artefacts (Fig. 19; cf. Oliva 2007, 29). From a morphological point of view, the prismatic as well as pyramidal forms are presented. Rejuvenated striking platform prepared by several blows slightly exceeds over the flat platforms. This could be an indicator of an advanced reduction, similarly as the traces of lateral sides and backs modifications, are also visible on some advanced cores.

Concerning refittings, one production sequence of a spongolite blade with a core in the advanced reduction stage was documented (Fig. 17: 2).

Among the knapped lithic industry, the category of debris and chips reaches the highest proportion (47% of all artefacts), with the flint as the dominant raw material, followed by undetermined burnt silicities. The majority of pieces are shapeless, undetermined fragments (Tab. 8). Many of them represent various broken segments, where is not possible to identify the original blank type (blade or flake) and the remaining items are morphologically varied shatters larger than 1 cm, followed by chips and flakes smaller than 1 cm, representing the fine waste from core processing or tool retouching. Although the proportion of burnt artefacts is relatively large in the assemblage, the thermic debris is represented by only 2 pieces.

The proportion of flakes includes only 19 pieces originating from various stages of core exploitation (Tab. 8). The presence of 3 fully cortical flakes and one shaping out flake with partially preserved cortex demonstrate, despite of absence of pre-cores in the assemblage, that the knapping process was beginning with the unmodified nodules of raw material. These flakes have cortical butts, in one case also damaged. The indeterminacy of other characteristic technological features does not allow the determination of the percussor type. Other pieces are without cortex, with transverse, centripetal or irregular dorsal scars and usually with flat butts. They represent the core maintenance flakes originating from an advanced stages of core reduction, knapped by soft-hammer stone and organic percussor (according to slightly prominent or absent bulb with the *"esquillement du bulb"* scars and no visible point of impact). One found tablet documents rejuvenation of the core striking platform.

	7/90	7a/93	7b/93	**Total**	%
Debris & undeterm. fragments < 1 cm	1	40	-	**41**	**11.9**
Debris & undeterm. fragments > 1 cm	13	64	10	**87**	**25.3**
Thermic debris	-	2	-	**2**	**0.6**
Chips & small flakes < 1 cm	-	33	-	**33**	**9.6**
Shatters > 1 cm	8	29	5	**42**	**12.2**
Cortical flakes (> 2/3 cortex)	1	2	1	**4**	**1.2**
Core tablets	1	-	-	**1**	**0.3**
Core maintenance flakes	2	7	-	**9**	**2.6**
Undetermined flakes > 1 cm	2	3	-	**5**	**1.5**
Crested blades	-	1	-	**1**	**0.3**
Secondary crested blades	-	-	-	**0**	**0.0**
Neo-crested blades	-	1	-	**1**	**0.3**
Secondary neo-crested blades	-	-	-	**0**	**0.0**
Side/flank blades	1	20	3	**24**	**7.0**
Blades & bladelets of *„plein débitage"*	5	29	6	**40**	**11.6**
Undetermined blades	10	23	6	**39**	**11.3**
Burin spalls	1	9	3	**13**	**3.8**
Other waste of tool production	-	2	-	**2**	**0.6**
Total	**45**	**265**	**34**	**344**	**100**

Tab. 8. Dolní Věstonice I – 7/90–93 excavation area. General technological composition of non-retouched artefact according to individual trenches.

Tab. 8. *Dolní Věstonice I – prostor 7/90–93. Technologická skladba neretušovaných artefaktů podle sond.*

	Crested	Side/flank	*Plain débitage*	Undet.	**Total**	%
Fragmentation						
complete	-	8	5	5	**18**	**17.1**
proximal	-	3	6	7	**16**	**15.2**
proximal-mesial	-	3	6	5	**14**	**13.3**
mesial	-	3	9	6	**18**	**17.1**
mesial-distal	2	5	8	6	**21**	**20.0**
distal	-	2	6	10	**18**	**17.1**
Total	**2**	**24**	**40**	**39**	**105**	**100**
Shape						
parallel	1	9	22	14	**46**	**43.8**
convergent	1	7	8	13	**29**	**27.6**
divergent	-	3	3	3	**9**	**8.6**
irregular	-	2	1	2	**5**	**4.8**
undetermined	-	3	6	7	**16**	**15.2**
Total	**2**	**24**	**40**	**39**	**105**	**100**
Cross-section						
triangular	2	3	15	15	**35**	**33.3**
trapezoidal	-	10	22	9	**41**	**39.0**
irregular	-	7	3	13	**23**	**21.9**
undetermined	-	4	-	2	**6**	**5.7**
Total	**2**	**24**	**40**	**39**	**105**	**100**
Profile						
straight	-	5	23	11	**39**	**37.1**
convex	2	12	7	7	**28**	**26.7**
divergent	-	4	-	6	**10**	**9.5**
undetermined	-	3	10	15	**28**	**26.7**
Total	**2**	**24**	**40**	**39**	**105**	**100**

Tab. 9. Dolní Věstonice I – 7/90–93 excavation area. Types of fragmentation and selected morphological features of non-retouched blades.

Tab. 9. *Dolní Věstonice I – prostor 7/90–93. Typy fragmentace a vybrané morfologické znaky neretušovaných čepelí.*

Non-retouched blades (Fig. 20: 1–9), numbering 105 pieces (complete pieces or fragments), compose the second largest category in the lithic assemblage (24%). Nearly all are preserved incompletely as various broken fragments (with intentional or not-intentional fracture character/causes of breakages), predominantly of the mesial-distal, mesial and distal parts, followed by proximal and proximal-mesial parts (Tab. 9).

The largest blade group (40 pieces) consists of blades and microblades of "*plein débitage*", representing the final product of blank production. They are predominantly non-cortical, with parallel dorsal scars originating from unidirectional knapping, which is also consistent with the character of preserved cores. Nearly 23% of all blades (24 pieces) represent the reparation blades, removed from the lateral parts of the cores during the process of core maintenance to rejuvenate the transversal convexity of the core's flaking surface. They are usually twisted in the longitudinal section and also with partially preserved cortex in lateral and lateral-distal parts. The beginning of blank production is documented by one crested blade, preserved as a broken mesial-distal fragment with the

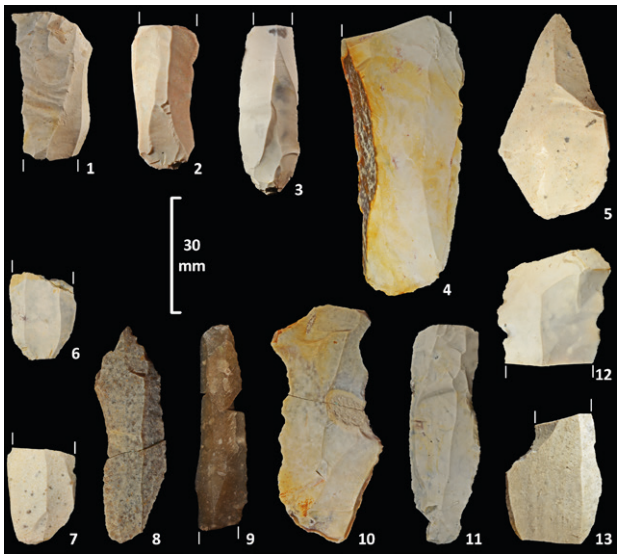


Fig. 20. Dolní Věstonice I – 7/90–93 excavation area. Blades and partially retouched blades. Photo M. Novák.

Obr. 20. *Dolní Věstonice I, prostor 7/90–93. Čepele a částečně retušované čepele. Foto M. Novák.*

crest prepared only on one lateral side whereas the second one remained untreated and fully corticated. One neo-crested blade, representing an attempt to rejuvenate the flaking surface, was also found in the assemblage as a broken mesial-distal fragment. Relatively high proportion of blades (39 pieces) remains closely undetermined, mostly due to advanced fragmentation, and they may originate from various phases of the *"chaîne opératoire"* process.

Prevailing linear, punctiform and flat butts (largely with no visible point of impact and some with the lips on the ventral side), traces of dorsal preparation of butt edges and absence of prominent bulb indicate use of a soft-hammer stone and organic percussor during the blank production. Although it was not possible to correctly determine the morphological features on a large number of fragmented pieces, the blades with parallel lateral edges, trapezoidal cross-section and straight longitudinal profile are more frequent in the assemblage (Tab. 9).

In terms of morphometry, the length of complete pieces ranges from 16 to 63 mm, the width of the blades is between 4–36 mm, and thickness varies between 1–16 mm. The mutual dependence of the width and thickness (Fig. 15) show that the most of the blades are in the range of 7–19 mm in width and of 2–7 mm in thickness where create a continuous pattern without significant gap between the blades and the microblades.

Pronouncedly massive pieces are rare, as well as there is also small number of microblades with the width between 4–5 mm. This is in contradiction with the preserved cores, where the microlithic forms with bladelet negatives exactly prevail, what could indicate they were transformed into the tools and carried away from the periphery to other parts (central) of the site. Comparing the morphometric data with the retouched tools shows that they are dimensionally more or less corresponding with the produced blanks although larger-sized tools are represented more than blades in the assemblage.

The group of retouched and partially retouched artefact consist of 69 pieces (Tab. 10). Nearly all are

	7/90	7a/93	7b/93	Total	%
Burins	4	12	1	**17**	**24.6**
Endscrapers	2	1	2	**5**	**7.2**
Backed artefacts	-	1	-	**1**	**1.4**
Retouched blades	2	8	-	**10**	**14.5**
Truncated pieces	-	2	-	**2**	**2.9**
Other tool types	-	4	1	**5**	**7.2**
Combined tools	1	-	-	**1**	**1.4**
Partially retouched pieces	4	21	3	**28**	**40.6**
Total	**13**	**49**	**7**	**69**	**100.0**

Tab. 10. Dolní Věstonice I – 7/90–93 excavation area. General typological composition of retouched artefact according to individual trenches.

Tab. 10. *Dolní Věstonice I – prostor 7/90–93. Typologická skladba retušovaných artefaktů podle sond.*

made from erratic flint, supplemented by few pieces from radiolarite and minimally by flint of the Krakow Jurassic type. Morphological features and dimension of the retouched artefacts correspond to the blank production. Typologically the assemblage can be characterized by predominance of burins over endscrapers, a relatively high proportion of retouched blades and a minimal number or absence of backed artefacts or microliths. With such proportions, the features allowing to classify the industry more precisely within the Gravettian chrono-typological framework are missing.

Considering the peripheral character of the 7/90–93 excavated area, the number of retouched artefacts is relatively high – 15.3% of the total assemblage, especially when compared with the others assemblages of peripheral character (unit S7 – Southern Edge at site DV II where the retouched artefacts reach only 1.3%; Novák 2016). On the other hand, most of the retouched artefacts are preserved only as fragments and may thus represent intensively used, damaged and than discarded pieces. The location within the site may also explain the low abundance of backed and likewise microlithic elements.

The most frequent are 17 burins, typologically varying from simple single blow burins to multifaceted and multiple combine types. They are largely made on blades, often fragmented, and few pieces are also on coarser flakes where can evoke a possible core-like artefacts. The most common types are multiple burins in various combinations (8 pieces), including two double burins on breaks (Fig. 21: 1–2), two double burins on truncations (Fig. 21: 3), a combination of multifaceted axis dihedral burin / simple angle dihedral form (Fig. 21: 4), axis dihedral type / simple burin on break, transversal burin / burin on break, and recently damaged double burin on break / opposite edge with flat type. Among the other types are 6 simple burins made on breaks (Fig. 21: 6), 2 angle dihedral burins (Fig. 21: 7–8), and a burin made by one blow on oblique retouched truncation. Such a variety of types corresponds with the burin collection from Klíma's excavations of units K2 and K3 (Klíma 1963, tab. 43–46; Klíma 1980, fig. 2: 4–8; Klíma 1981b, fig. 1: 3–6).

Total of 5 endscrapers have been recorded (Fig. 22: 1–5). Two pieces, a complete one tanged at the base and a fragment, represent regular forms with oval shaped heads made on a bilaterally retouched blades. Others are a fragment of wide endscraper made on unilateral retouched blade, an atypical double endscraper with irregular roughly shaped heads made on a crested thick blade, and an irregular fragment of blade endscraper damaged by burnt. Additional endscraper with a weakly oval formed head is combined with an angle dihedral burin (Fig. 21: 6).

The microlithic backed implements are represented only by one radiolarite proximal-mesial fragment of a backed bladelet with short abrupt retouch opposite the backed edge (Fig. 21: 7).

The retouched blades (Fig. 21: 8–11) number 10 pieces and except two pieces are preserved only as broken fragments. The retouches are mostly unilateral with short marginal extent and always situated on dorsal side.

Truncated blades are represented by two atypical pieces (Fig. 22: 12–13). One of them is a distal blade fragment damaged by burning, with a transversal weakly concave abrupt retouch. The second piece shows an oblique retouched truncation and a removal resembling the Kostenki knife modification on the laterally retouched edge.

There are 4 chisels or splintered pieces (Fig. 22: 14–17), including two (mesial-distal and distal) fragments of narrow blades, both unilaterally retouched with short marginal retouch, and with bipolar splittered modification of distal end, supplemented by distal fragment of bilaterally retouched massive rough and wide blade, at the end oblique transversally modified from the ventral face and on the dorsal side with a negative resembling the trimming of Kostenki knife. The last one is recently damaged, distal blade fragment transversally splittered on dorsal face.

One discovered borer (Fig. 22: 18) was made on the proximal end of unilaterally retouched blade with the angle tip bilaterally formed by steep concave retouch.

Partially retouched artefacts number 28 pieces (Fig. 20: 10–13), predominantly represented by blades and their fragments (19 pieces), complemented by several pieces of flakes and undetermined fragments. They are characterized by minor discontinuous retouch usually situated at the lateral and rarely distal edges, both dorsal and ventral sides, resulting while the artefact were used.

The inventory of knapped lithics is completed by 13 burin spalls and 2 others removals, characterized as tool production waste with closely unclear determination between flat burin spalls and trimming spalls of Kostenki knives (Fig. 22: 19–20). The burin spalls are represented by 6 pieces of first series and 6 pieces of second series, from burins rejuvenation. One fragment remains undetermined. The 5 pieces were found complete, the others are preserved only as broken fragments of mesial and mesial-distal parts. Traces of lateral retouches from dorsal as well as ventral side are presented on 9 pieces and probably represent a preparation of the edges prior to the removal of the burin spalls. No burin spalls refitt with any burin.

9.3. Trench 9/90

This assemblage includes a total of 84 artefacts, nearly all made from erratic flints. Only one radiolarite fragment were found and other 11 pieces are burnt and stay undetermined.

The group of debris is not the most numerous group of artefacts in this case, probably because the sediment was not sieved. Therefore, this category includes fragments larger than 1 cm (26 pieces) and rough irregular shatters (6 pieces), representing closely undetermined waste from the process of knapping.

One burnt core, measuring 38 × 32 × 20 mm was identified (Fig. 23: 1): a single-platform specimen intended for blade-microblade production and abandoned at the advanced reduction stage. The striking platform is flat, prepared by one blow and abraded on the edge with exploitation surface. The back is also modified, by one opposite flake blow from the bottom part of the core (base) probably with the intention to narrow the thickness of the core.

The category of flakes includes 9 complete or almost complete pieces, measuring in length from 23 to 52 mm, in width from 15 to 49 mm and in thickness from 4 to 14 mm. The five pieces are without cortex, four pieces have partially preserved cortex on lateral and distal part and they were knapped during an advanced stage of core reduction by soft-stone hammer according to typical technological features like the plain butt with visible percussion point and presence of bulb with the scar of *"esquillement du bulb"* on the ventral side. Directions of the dorsal scar patterns, that are mostly irregular or transversal, suggest that they are products of the core maintenance and reparation process during the knapping. The two tablets, as a result of striking platform rejuvenation, are also presented.

There are 28 non-retouched blades (illustrated in Svoboda 1993, tab. 3: 1–4, 6, 9, 10, 12–15, 18, 19, 21, 22) but only 6 of them are complete and the others are preserved as various broken fragments, where proximal-mesial segments (11 pieces) predominate, followed by mesial-distal (4 pieces), distal (4 pieces) and mesial fragments (3 pieces). The length of complete pieces ranges from 19 to 42 mm, although the two fragments exceed this value up to 53 mm. The width of the blades is between 6 and 25 mm and the thickness varies between 2 and 8 mm (Fig. 16). It shows that the microblades are nearly missing and they are replaced by narrow and thin blades with the width ranges from 8 to 14 mm that are predominant in the assemblage. These values also correspond with the morphometry of

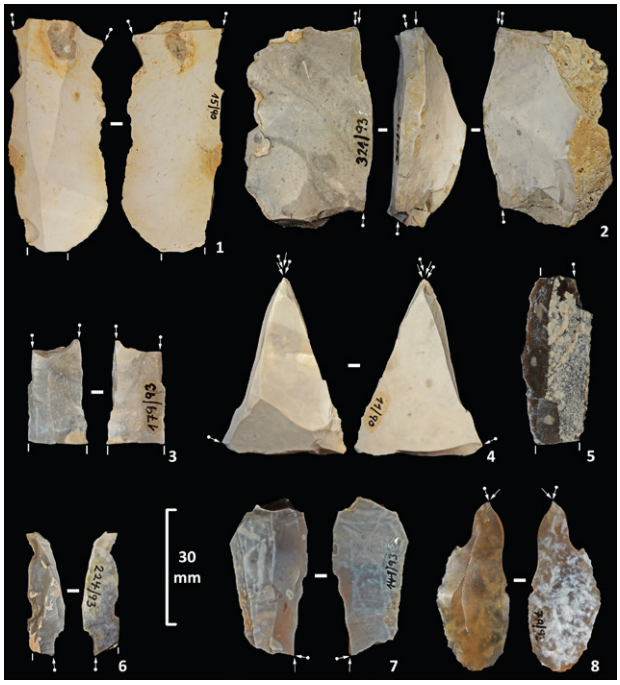


Fig. 21. Dolní Věstonice I – 7/90–93 excavation area. Burins. Photo M. Novák.

Obr. 21. *Dolní Věstonice I, prostor 7/90–93. Rydla. Foto M. Novák.*

Fig. 22. Dolní Věstonice I – 7/90–93 excavation area. Retouched tools. Photo M. Novák.

Obr. 22. *Dolní Věstonice I, prostor 7/90–93. Retušované nástroje. Foto M. Novák.*

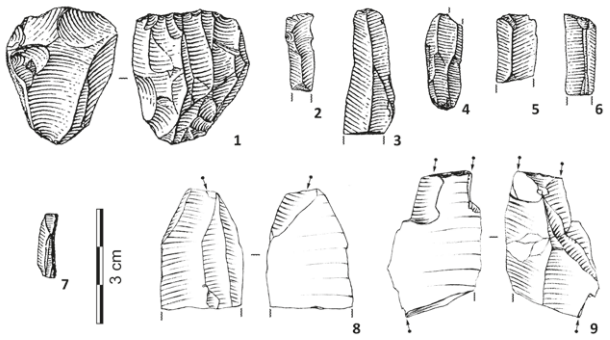


Fig. 23. Dolní Věstonice I – trench 9/93. Selection of artefacts. Graphic M. Novák and A. Krechlerová.
Obr. 23. *Dolní Věstonice I, sonda 9/93. Výběr artefaktů. Grafika M. Novák a A. Krechlerová.*

retouched artefacts that are largely in the same ranges. Therefore, we suggest that the tools were produced from blades originating directly from this site.

Due to the considerable fragmentation of blades, it is not possible to classify all pieces within the *"chaîne opératoire"* process. Basing on certain features, majority of the blades (17 pieces) could be included into the group of *"plein débitage"* as final blanks; pieces with parallel unidirectional dorsal scars predominate, usually with parallel shape of lateral edges, triangular cross-section and straight longitudinal profile. Four pieces resemble blades from the core lateral sides removed during the process of the core's flaking surface maintenance; others are undetermined.

The butt type of the blades could be specified in 10 pieces only and is usually flat (5 pieces), with pronounced lips on the ventral side, linear (3 pieces), and punctiform (2 pieces). Other blades have either completely missing or broken butt or the butt, in some cases too small for a determination. Most of the pieces have visible traces of abrasion of the overhangs so that bulbs and points of percussion are not visible. These features indicate use of a soft-hammer percussor (stone and organic).

Retouched artifacts number 11 pieces consisting of 8 retouched tools and 3 partially retouched pieces. Common are truncated artefacts (5 pieces) although only one of them is complete and typologically clear – a short microblade with straight retouched truncation situated proximally (Fig. 23: 2). A second piece, an irregular blade fragment with weakly convex retouched distal end (Fig. 23: 3), is more debatable and could resemble an atypical, non-distinctive blade endscraper without retouch on lateral edges. Three others are only fragments of narrow blades where transversal retouch is damaged, probably due to breakage from use (23: 4–6).

Only one typical Gravettian microlithic backed implement has been identified: a thin backed bladelet with transversal retouched truncation in the apical part and direct small partial retouch opposite the backed edge in the basal part (Fig. 23: 7).

There are two burins: a strongly burned mixed multiple burin made on a thick blade fragment and combining a double burin on truncation with a burinated edge on a break (Fig. 23: 9). Similar multiple types of thick burins are also presented in the collections of Klíma's DV I excavated units K2 and K3 (Klíma 1963, tab. 46: 674; Klíma 1981b, fig. 1: 5, 6). The second one is a partially burned plane transversal burin made at the apical part of a blade fragment (damaged by burning) by flat single burin blow from ventral face (Fig. 23: 8). Similar flat-faced burins on blades were also found in the Klíma's collection of units K2 and K3 (Klíma 1963, tab. 46: 678; Klíma 1981b, fig. 1: 4).

Partially retouched pieces are represented by a mesial blade fragment (Svoboda 1993, tab. 3: 5), a microblade, both with a short discontinuous retouch on the lateral edges from the ventral side, and a partially corticated preparation flake with discontinuously retouched truncation at the distal end.

9.4. Trench 10/90

According to location and depositional context, this assemblage could by associated with industry from Klíma's settlement unit K2. A total of 26 lithic artefacts were collected, mostly white patinated, made of erratic flints, and only four pieces were burnt in fire and thus remain undetermined. The most numerous group is debris (12 pcs.), including predominantly undetermined fragments, usually larger than 1 cm, supplemented by two shatters and one small flake or chip from core reduction process.

The group of non-retouched blanks is represented by two flakes and ten blades that are preserved only as broken fragments. The flakes are non-cortical, and according to irregular dorsal scar patterns they probably came from the core maintenance during the knapping. The both have linear butt and preserved diffuse bulb with typical scar of *"esquillement du bulb"*. All this features indicate using of soft-stone hammer.

The blade fragments (Svoboda 1993, tab. 3: 23–26) were preserved as three proximal, three mesial, three distal and one proximal-medial part, with length between 8 to 34 mm. According to morphometry, there is no clear gap between microblades and blades. The width varies from 6 to 15 mm with an average of 10 mm and the thickness ranges between 2 to 7 mm and the average is 3 mm.

As well as flakes, the majority of blades are non-cortical except one piece with partially preserved cortex on the left lateral edge in distal part. Nearly all blades have parallel dorsal scars originating from single-platform cores, with triangular and trapezoidal cross-section and they are of *"plein débitage"* representing the final products of blank production. One piece was removed from lateral part of the cores and one fragment is undetermined.

The use of hammer type was possible to recognize only in one case, due to absent or crashed butts on majority of pieces. The largest preserved, proximal-mesial fragment was probably knapped by soft-stone hammer, according to narrow plain butt with visible percussion point and weakly formed lip as well as with absent bulb and traces of dorsal thinning of platform edge.

No retouched artefacts were found. Possible production of tools or their reutilization on the area could be represented by two pieces, resembling atypical, wide and short burin spalls of primary series or closely undetermined removals to decrease and narrow the terminal part of the artefact (e.g. trimming spalls of Kostenki knives). Similar pieces were also found in the trench 7/90–93.

10. Conclusion

The 1990–1993 excavation documents sequences of the basal landslides, the deposition of loess with MIS3 paleosols and anthropogenic deposits (cultural layer), the effects of postdepositional processes, and the LGM eolian sedimentation of varying thickness over the site. The last loess coverage is shallow or even absent in SW part of the site (where the Tertiary silts reach almost the actual surface) and increases in thickness of several meters towards the NE. In the middle and uppermost parts we localized various disturbances, namely pits of prehistoric and protohistoric age, agricultural recultivation, and earlier excavation trenches by Absolon and Klíma. Additional chronostratigraphic, radiometric and archaeological evidence was recorded especially from the lower and uppermost parts of the site.

10.1. The case of microstratigraphies

In terms of stratigraphy, recent excavation at the large Gravettian sites focus on places where complex microstratigraphies arised from continous settlement processes (i.e., not from redeposition). Field techniques using 3D artefact recording enable to approach such situations in terms of chronology and change in inventories (as at Pavlov I, excavation 2013–2015, and DV IIa, excavation 2012). In addition to trench 1/90 (where the microstratigraphy was dated but has no archaeological context), trench 7a/93 offers a case where the records enable to separate mechanically various levels (Fig. 8), but the artefactual evidence lacks diagnostic tool-types and shows no developmental trends. The spongolite as a material which indicated earlier occupations at sites DV IIa and Pavlov I, occured here in various levels. With the data in hand we cannot decide wheather the overlapping anthropogenic deposits in this case originate from redeposition or from repeated human occupations.

10.2. The case of site peripheries

In terms of spatial organisation of these sites, the actual questions address the center-periphery relationships from perspective of the whole site (where the variability along the peripheries suggests functionally diverse utilisations, Verpoorte 1997; Bartošíková 2005; Novák 2016) and in detail of one residential unit (dominance of microliths and decorative objects in center versus voluminous cores/precores and heavy mammoth bones outside, Svoboda *et al.* 1993).

From viewpoint of the new excavation at Dolní Věstonice I, we conclude that the lower part represents a case of extensive, mostly sterile zone with network of separate hearths and burnt zones with rare or no artefactual record whereas the trenches in the uppermost part document peripheric areas related to previously excavated residential centers K2 and K3.

10.3. Lower part of the site

The lower part of the site, in elevation of about 200 m a. s. l., consists of loess and sandy-loess deposits several m thick, partly landslided. When the lower part of the site was redesignated the middle, the question arose of how the lower part should now be defined. In response to a direct question, Klíma (pers. comm.) indicated as a boundary the sunken lane (*Hohlweg; Úvoz*). This would be quite an artificial division, because the sunken lane directly transected the settlement concentration of the middle part. If we set a more natural boundary, i.e. along the lower edge of the middle part, it would not leave much for the lower part. Traces of settlement in the thick loess deposits of this space are few and far between, and the high radiocarbon dates obtained from here relate more to underlying MIS 3 paleosols than archeological layers (Haesaerts *et al.* 2004; 2010). The charcoal was C^{14}-dated in several sections in the area, the measured values correspond to Early Gravettian (34–31 ky BP) or earlier, but it is not clear from Klíma´s comment (1995b) wheather any artefacts were associated - including the GrN-11189 date where Klíma (1995b, 54) verbally indicates a cultural context (*Fundhorizont*).

The two new dates, obtained in direct superposition from trench 1/90, provided no artefacts either, but the upper charcoal lense at 1/90 and another lense at 2/90 display the formal features of a hearth. A network of isolated hearths without archaeological context were observed along peripheries of other sites in the area as well (a case of a comparable peripheric area, excavated on a larger scale in 2009, was Pavlov II).

10.4. Uppermost part of the site

The uppermost part shows a specific structure. It consists of two discrete residential units, K2 and K3, in the same elevation of about 235 m a. s. l. and 30–40 m from each other, and a separate lense of cultural layer between (trench 9/90). Unit K2, excavated in 1951–1952 (Klíma 1952; 1963) represents the best preserved and indisputable ground plan of a Paleolithic dwelling. It lay by the bank in the upper part of a water-filled furrow and originally appeared to be isolated. It was recessed into the slope up to a depth of 80 cm. The excavated material, reinforced by stones and sealed up with clay, forms a low wall encircling an inner space with a diameter of 6 m. The whole situation was covered over by a layer of mammoth bones and stones. Under its nappe lay a hollowed-out hearth in the middle of the cultural layer, surrounded on three sides by red-burnt loess. This material was also redeposited across part of its surface by slope movements, which may have created the impression of the collapsed vault of some kind of oven. By wet-sieving sediment from the interior of the unit, Klíma obtained numerous lumps of fired clay, including fragments of zoomorphs. An adjacent oval concentration of lithic artefacts lies several meters to the west, thus indicating an activity zone in the exterior.

Unit K3, excavated in 1978–1979 (Klíma 1980a, b; 1983a, b) represents another settlement concentration towards the west. Here a central role was played by pan-shaped pit (100 cm in diameter and 60 cm deep), outlined by rim of clay mixed with rubble. Filling of the pit was composed by mammoth bone fragments burnt to a variety of colours grading from orange, red and rusty to brown, grey and black. Wooden charcoal was rare, but burnt bone was frequent. Two narrow grooves ran from the entrance, but today we can no longer determine whether these were actually air ducts or simple erosion furrows or animal burrows (as are often found on our sites). As at K2 (and elsewhere at site DV I), clay plastics were present, namely a head with four holes on the top or a massive irregular shape, in which Klíma saw analogies of a female figurine. Although the both units provided complex hearth facilities in center, there are no grounds to reconstruct vaulted "owens" as has been suggested previously.

Klíma dated unit K3 by C14 and here we add another date from trench 10/90, related to K2 (Tab. 2). Both dates support the Evolved Gravettian (Pavlovian; 31–29.5 ky BP) age for the uppermost part of the site. Trenches 7/90 identified the previous excavation and trench 7a/93 expanded the area upslope towards the southwest and monitor the changing character of the cultural layer. Here, the cultural layer is typically composed of separate lenses of greyish humous sediments while domestic features such as hearths and pits are absent (a case of a comparable, recently excavated peripheric area was unit S7 at DV II, Southern Edge, excavation 1991 and 2005).

10.5. Effect of archaeological discard and selection

Sites explored in long-term intervals open questions of changing excavation methods and selection. At DV I these patterns are documented in the middle part of the site (trench 3/90, refill of Absolon´s excavation). As at other early excavated sites (Předmostí) we observe that the discard concerns animal bones predominantly (probably because of problem with depository space) and within this category, a comparison with faunal data from excavations by Absolon and Klíma (Wilczynski *et al.* 2015) shows that burnt bone was discarded more frequently than unburnt pieces. In contrast, lithic artefacts were collected more systematically by the early excavators so that items found in today´s refills were probably overlooked.

10.6. The inventories

Inventories from the lower part of the site are extremely rare (a bone fragment from trench 2/90), in agreement with a specific character of the area.

Majority of the newly recovered materials originates from the uppermost part of the site (trenches 7–10/90–93). The vertebrate fauna is well comparable with (also peripheric) unit S7 (Southern Edge) at site DV II by species composition (dominance of mammoth), a higher fragmentarization, and prevalence of bones at lower stages of burning (I–III). This suggests bone marrow and grease extraction at place. The pre-Quaternary fossil assemblages (in contrast to previously published collections dominated by specimens from nearby Miocene beds) are Mesozoic in two of the three cases. Lithic raw material composition with dominance of flint and radiolarite is standard at these sites (presence of various cherts and spongolites is to be noted), and about 15% of the lithic materials is burnt. The most numerous are small chips, flakes and irregular fragments, followed by the group of blanks, larger retouched pieces, their fragments and waste from their production, and a variety of cores. Microliths are almost absent. Following the S4 model presented at site DV II (Svoboda *et al.* 1993), such observations may reflect processes taking place at peripheric parts of the residential units.

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Resumé

Lokalita Dolní Věstonice I (DV I) má v rámci areálu Dolní Věstonice – Pavlov – Milovice nejdelší historii výzkumu a vydala nejznámější nálezy (kosterní pozůstatky pleistocenního *Homo sapiens* a klasické artefakty gravettského umění, včetně ikonické Věstonické venuše; obr. 1–3; Bayer 1924; Jüttner 1939; Absolon 1938a, b; 1945; Klíma 1963; 1969; 1983a; Tomášková 1995; Trinkaus, Svoboda, eds., 2006; Eickhoff 2013; Kostrhun 2014; Oliva 2014; Svoboda 2016). Avšak složitá terénní situace, diskontinuita mezi jednotlivými výzkumnými etapami a nedostatek komunikace mezi některými vůdčími badatelskými osobnostmi ztěžuje retrospektivní interpretaci lokality jako celku (cf. Klíma 1981a; 1983a; 2001; Verpoorte 2000; Oliva 2014; Svoboda 2016). V tomto článku předkládáme výsledky poslední výzkumné etapy, kterou vedl Archeologický ústav AV ČR, Brno, v letech 1990 a 1993.

1. Cíl a strategie výzkumu

Dokud lokalitu pokrývala síť políček a vinohradů, byla zkoumána povrchovým průzkumem (všichni badatelé), odkryvy a sondážemi v nejatraktivnějších centrálních částech (Absolon, Bohmers, Klíma) a sítí vrtů v okolí (Žebera in Knor *et al.* 1953; Klíma 1963). Velkoplošné odkryvy proběhly převážně již před rokem 1952, zatímco následné výkopy měly spíše charakter jednotlivých sond (v té době se už velké a systematické výzkumy přesouvaly na lokality Pavlov I a DV II). Po zemědělské rekultivaci plochy v 70. letech se plocha lokality zcelila do jediného vinohradu.

Vzhledem k nepřístupnosti centrálních částí a snaze o vymezení vnějších hranic lokality jsme v roce 1990 a 1993 položili linii sond podél cest vymezujících její okraj západní (sondy 1–6a/90) a jižní (sondy 7–12/90 a 7a/93). Pro hlavní sondu 7a/93 existuje 3D prostorový záznam a kulturní vrstva byla proplavena. Nově získané údaje umožňují otevřít diskusi k otázkám celkové geologické stavby i lokálních mikrostratigrafií, radiometrické chronologie, vztahu centrum-periferie (na úrovni celé lokality i jednotlivých rezidenčních celků) a struktury faunistických a artefaktových souborů z periferních zón. Ne všechny otázky lze v této chvíli vyřešit.

2. Stratigrafie a chronologie

Geologický a geofyzikální průzkum za podpory dat LIDAR ukazuje, že lokalita se rozkládá na tělese rozsáhlých bazálních sesuvů, které jsou tvořeny redeponovanými terciérními slíny a jíly, místy promísenými klasty jurského vápence (https://mapy.geology.cz/svahove_nestability/; obr. 1a). Na takto formovaném podkladu se místy ukládala spraš, tvořily se půdy (převážně během MIS3) a ukládala se antropogenní kulturní vrstva, resp. vrstvy (obr. 5–6, 8–9). Celé toto souvrství průběžně formovaly (či přesněji řečeno deformovaly) následné, prostorově omezené sesuvy (obr. 9), které doplňuje vodní eroze, mrazové jevy, mikrotektonické dislokace a přesmyky vrstev, čímž se na svazích Pavlovských vrchů utvořil typicky nerovný paleoreliéf. Ten částečně překryla a zarovnala masivní eolická sedimentace během posledního glaciálního maxima (LGM), následovaná zemědělskými úpravami celé zkoumané plochy v době historické. Ve srovnání s jinými lokalitami na témže svahu je tedy na lokalitě DV I vliv sesuvů na archeologické vrstvy a situace největší.

Přitom počet dat C^{14} je relativně nízký (obr. 10, tab. 2), neboť velké části plochy byly zkoumány ještě před objevením této metody (nicméně šlo o jednu z prvních českých lokalit, kde byla pohotově aplikována). Nejstarší série datací pochází ze spodní části lokality, z uhlíků v hnědých půdách v podloží kulturní

vrstvy, bez artefaktového kontextu. K této sérii dat nyní připojujeme dvě datace v superpozici (svrchní zřejmě ze standardního ohniště), které chronologicky odpovídají časnému gravettienu (34–31 ky BP). Data ze střední a horní části lokality většinou postrádají přesnější kontext a provenienci, ale celkově odpovídají vrcholnému gravettienu (pavlovienu; 31–29,5 ky BP). K této fázi se řadí i data z části nejvyšší, kde k předchozímu datu B. Klímy pro rezidenční celek K3 připojujeme obdobné datum, které vzhledem k poloze vztahujeme k celku K2.

3. K otázce mikrostratigrafií

Aktuální otázkou současného výzkumu velkých loveckých sídlišť je analýza členitých mikrostratigrafií všude tam, kde se utvořily plynulým osídlením - tedy bez vlivu redepozice. Terénní techniky založené na 3D záznamu umožňují postihnout v rámci gravettienu určité vývojové trendy (Pavlov I, výzkum 2013–2015 a DV IIa, výzkum 2012). Pokud odhlédneme od jednoduchých superpozic v sondách 1/90 a 10/90, pak by tento typ výzkumu potenciálně umožňovala mikrostratigrafie dokumentovaná v jihozápadním rohu sondy 7a/93 (obr. 8). Avšak datace jednotlivých horizontů v tomto případě chybí a industrie není dostatečně diagnostická. Spongolity, které jinde mohly indikovat starší osídlení (DV IIa, Pavlov I) se zde vyskytly v různých výškových úrovních. Nelze tedy v tomto případě rozhodnout, zda zvrstvení vzniklo redepozicí sedimentů nebo opakovaným osídlením.

4. Otázka centrum – periferie

Z hlediska prostorové organizace velkých sídlišť se současný výzkum zaměřuje na vztahy centrum – periferie. V areálu Dolní Věstonice – Pavlov – Milovice se této otázce věnovalo několik předchozích studií, které naznačují určitou funkční diverzitu okrajových zón v měřítku celých lokalit (Verpoorte 1997; Bartošíková 2005; Novák 2016) i jednotlivých rezidenčních celků (Svoboda *et al.* 1993).

Z hlediska nového výzkumu lokality DV I lze konstatovat, že zatímco její spodní část je příkladem rozsáhlé a sporadicky užívané plochy s dílčími humózními a uhlíkatými čočkami (ohništi), sondy v části nejvyšší dokládají charakter okrajových ploch přilehlých k již prozkoumaným rezidenčním celkům K2 a K3 (obr. 11).

5. Otázka starší archeologické selekce

U inventářů shromažďovaných v dlouhých časových intervalech a s odlišnou metodikou výzkumu vzniká disproporce nejednotné selekce v terénu. V našem případě to ilustruje archaeologický a faunistický materiál ze střední části lokality (sonda 3/90 – výplň Absolonovy sondy). Je patrno, že zkartace na místě v minulosti postihovala osteologický materiál více než štípanou industrii (jistě i vzhledem k problémům s úložnými prostory) a v rámci souboru kostí více ty spálené než nespálené. Naproti tomu štípaná industrie byla vybírána více systematicky, takže ve starých výplních se objeví spíše ty přehlédnuté kusy. Takové relace jsou jistě přirozené a očekávatelné (srv. například Předmostí).

6. Spodní část lokality

V této části lokality, ve velkých částech plochy sterilní, jsme lokalizovali pouze jednotlivé humózní a uhlíkaté čočky. Ve dvou případech splňují formální znaky ohniště; datování odpovídá časnému gravettienu. Síť izolovaných ohnišť bez artefaktového kontextu (jen s fragmenty kostí) na rozsáhlých plochách je typická pro periferii gravettských sídlišť obecně (z nově zkoumaných např. Pavlov II).

7. Nejvyšší část lokality

Sondy z let 1990 a 1993 rozkryly periferii a okolí rezidenčních celků K2 a K3 (Klíma 1963; 1981b; 1983b), které se nyní jeví jako samostatné jednotky v téže výškové úrovni a ve vzdálenosti asi 30–40 m. Datování odpovídá v obou případech vrcholnému gravettienu (pavlovienu). Oba měly v centru komplexní ohniště (zde je třeba poznamenat, že z terénní situace není patrný důvod, proč nad nimi bývá rekonstruována zaklenutá „pec“). V obou nalezl B. Klíma mimo jiné vypalované plastiky z hlíny (což je na lokalitě DV I opakovaně dokumentovaný jev). Jestliže celku K2 se nový výzkum pouze dotkl, pak v okolí celku K3 mohla být podrobněji analyzována struktura okrajové části kulturní vrstvy, komponovaná z jednotlivých čoček šedavých humózních sedimentů (sídelní struktury i symbolické předměty zde chybí). V tom smyslu ji srovnáváme například s lokalitou DV II, celek S7 – jižní okraj: obratlovčí fauna je obdobná z hlediska druhového spektra (dominuje mamut), s intenzívnější fragmentací a s převahou kostí v nižších stupních spálení (I–III), což indikuje extrakci kostěného morku a tuku. Kamenná industrie je standardní z hlediska surovinové skladby (dominantní pazourek a radiolarit, nižší výskyt různých rohovců a spongolitů) a část artefaktů je rovněž spálena. Jednotlivé fáze technologického procesu (včetně jader) jsou zastoupeny celkově proporčně, ale retušované artefakty jsou spíše fragmentární a mikrolity téměř chybí, což odpovídá perifernímu charakteru této zóny (srv. model S4 pro lokalitu DV II; Svoboda *et al.* 1993).

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