Chapter 4
Settlement Strategies

4.1. Introduction

4.1.1. Theoretical Background of Settlements Strategies Studies

Since the last quarter of the twentieth century, archaeology has been characterized by a new approach – landscape archaeology (Gojda 2000, with ref.). Kuna (2000) presented a history of landscape studies in the Czech Republic. However, both authors were focused ceramic-based cultures (i.e. from the Neolithic through Middle Ages) and ignored the Paleolithic. In my opinion, the Paleolithic has a number of specific issues associated with it and therefore requires a specific approach (cf. Klíma's "Pleistocene Archaeology" approach). Therefore, I would argue that the approaches and theoretical constructions proposed by Kuna and Gojda are not applicable in the case of Paleolithic. An example of why this is so can be seen an examination of Kuna's key work: In his approach, Kuna favors replacing the "questionable" concept of "site" in the context of field survey with an analytical method based on the measurement of surface artifact densities over larger segments of the landscape (Kuna 2000:31-32). According to him, it becomes clear that a site-oriented approach does not work well within the scope of landscape archaeology and regional settlement studies (Kuna 2000:32).

If a similar approach were to be adopted in archaeological research on the Paleolithic, the result would be a map (or selected transects) with artifacts that were accumulated over ten thousands of years, representing different cultures and resulting from different activities (social, technological, etc.). We are able to classify culturally using statistical method (Klíma 1956) only large collection. In addition, there are only occasional artifacts, which we are able to classify and attribute to any particular culture. Such in the case that artifact is attributed to the particular culture, the culture surveyed for several thousands years and we are not able to recognize if artifacts found at the same spot are contemporaneous or result of several visits of the spot. We are not able to specify the activity which artifact resulting from. Only collections excavated from stratified sites may by dated absolutely. Basing on available database consisting of excavated stratified sites, surface sites and isolated artifacts, the possibilities of application of behavioral approach known in the literature as off-site Archaeology (e.g. Bintliff and Snodgrass 1988) are very limited or, unfortunately, non-applicable to Uherské Hradiště Area Paleolithic Archaeology in this moment. However, when surveying will continue in the same extent for several more years, the database would be significantly enlarged and off-site approach would be tested.

Another argument against the abandonment of a site-oriented approach is the relatively rugged relief of Moravia, where settlement patterns reflect its systems of river valleys and uplands. In fact, occupation patterns may be said to be predetermined by geomorphological factors. For example, a significant difference may be noted between Australia, where the relief predominately flat, post-depositional changes were limited and therefore Aboriginal artifacts may be found basically anywhere and everywhere, and Moravia with its rugged relief, strongly disturbed by post-depositional changes, meaning that artifact clusters have survived only in suitable and undisturbed locations.

Based on the previous discussion, I would therefore now like to define the basic terms used in this work. In addition, I will define the basic terms and methodology used in surface surveys. This will be followed by an analysis of the data.

Isolated find
In this work, an isolated find is defined as an isolated knapped stone artifact, with no other finds recorded in the immediate vicinity (up to ca. 50 meters). However, other factors in making this determination that must be taken into account include the geological background, the intensity of survey as it was carried out (the number of visits, the current depth of plowing, surface visibility conditions, etc., for further details see Kolbinger 1995 with ref.). There is a possibility that continuing survey under more favorable conditions may result in more finds at a particular find spot and that the isolated find spot will therefore be redefined as a full site. For these reasons, as our schedule and the field conditions allowed, selected spots were surveyed repeatedly. During our surveys the geological

context (sediments, bedrock) was reported with special attention given to the presence or absence of loess, osteological material, calcium carbonate concretions and calcium carbonate coatings on artifact surfaces, all of which may indicate the presence of a stratified cultural horizon. Here I must agree with Kuna, who discussed the need to consider even very small number of artifacts as being archaeologically significant (Kuna 2000:42).

The distribution of isolated artifacts within a landscape is an important source of information. When an area is subject to a high intensity survey (repeated over several years) and the positions of all artifacts is recorded in absolute coordinates, the movement and activity of humans within a specific landscape may be revealed. Unfortunately this is not the case of the Uherské Hradiště Area, where our survey was limited, both in terms of territorial coverage and frequency.

Artifact cluster – site
A Paleolithic site is defined as a concentration (cluster) of knapped stone artifacts. A density of three artifacts over an area 50 m in diameter was selected as a criterion to distinguish between an isolated find and a site. I consider this density to reflect a non-random pattern. In the vast majority of cases, the density is significantly higher and the site dimensions are much greater.

Site-cluster
A site cluster is defined as a concentration of settlement activities within a limited area of up to ca. one kilometer in diameter. The Jarošov II Site-cluster represents a typical Gravettian site-cluster. Jarošov II consists of four sites: Podvršťa, Procházka's excavations, Valoch's excavations, and "Žleb." Other Gravettian site clusters are the Spytihněv Site-cluster consisting of four sites: Němeča, Duchonce, Nad vinohrady, and Podvinohradí (the latter is on the neighboring cadastral territory of Napajedla), and the Napajedla I and Napajedla II-III site-clusters. Typical Aurignacian site-clusters include the Tučapy Site-cluster consisting of four sites: Koukolky, House No. 15, Nad horkami, and Nad panským, the Kudlovice Site-cluster consisting of several units: the Hradská sites and Za Hradskou sites, the Topolná Site-cluster consisting of three units: Bukovina, Osičná, and Nadmezná, and others.

Settlement microregion
The settlement microregion is defined as an agglomeration of several sites within an area several kilometers square. The accumulation of sites in this case is geographically determined. One typical Gravettian settlement microregions are the Spytihněv-Napajedla microregion in the Napajedla Gate consisting of Napajedla I, II, III, V, VI, VIII, and the Spytihněv site-cluster, covering an area ca. five kilometers in diameter. Another is the Gravettian Jarošov settlement microregion, which consists of Kněžpole-Hrádek, the Jarošov II Site-cluster and Mařatice-Kolébky. This microregion covers an area ca. 3.5 kilometers in diameter. Typical Aurignacian settlement microregions are the Tučapy-Buchlovice microregion, ca. seven kilometers in diameter and the Traplice-Kudlovice-Halenkovice microregion, ca. seven kilometers in diameter. In conclusion, the Uherské Hradiště Area may be defined as a settlement unit, consisting of several intensively occupied microregions, several site-clusters and other isolated sites.

For the study of the spatial distribution of Paleolithic sites I prefer to use the Settlement Strategy approach, which is based on finding geographic characteristics that are common to the majority of the primary sites. A working hypothesis for describing the placement of sites within a landscape was developed:

There is a standardized settlement strategy within the framework of particular Paleolithic cultures, and it is possible to characterize it using an n-dimensional vector composed of archaeological, geological, geographical, and other data.

If this hypothesis is accepted, it means that there exists an Aurignacian settlement strategy, a Gravettian settlement strategy and that other Paleolithic cultures will have unique settlement strategies differing from each other. Using this characteristic vector, it is possible to classify of sites lacking diagnostic collections of artifacts and isolated finds based on their location within a landscape. Another potential application is the predicting of as yet undiscovered sites. This working hypothesis has been tested in several papers (Škrdla and Svoboda 1998; Škrdla and Lukáš 2000, Škrdla 2003).

When applying this hypothesis to the Uherské Hradiště Area, the characteristic vectors for the Gravettian occupation and the Aurignacian occupation were defined. There is insufficient data to define characteristic vectors

for other cultures. However, based on this research I and others are predicting the presence of different Epigravettian/Epiaurignacian sites, which are not yet possible to identify.

This hypothesis also presents the possibility of comparing settlement strategies in different regions. Comparison of the Uherské Hradiště and the Dolní Věstonice-Pavlov areas have shown striking similarities (Škrdla and Svoboda 1998; Škrdla and Lukáš 2000).

When studying settlement strategies, it is necessary to take into account the facts that traces of hunter-gatherer settlements have been erased or removed over the course of tens of thousands of years through the acitivities of fluvial and slope geomorphological processes (see the section immediately below for further details).

Another question concerns the proportion of a landscape that has been surveyed and, the proportion of as yet undiscovered sites. There can be no doubt that there are and will be a specific percentage of sites that have not yet been discovered because loess, colluvial sediments or alluvial sediments cover them.

Therefore, our current study of settlement strategy may by distorted and fragmentary and, in fact represent only a part of a complex mosaic of past settlement patterns.

The study of settlement strategies has been aided by the development of Geographic Information Systems (GIS), which consist of two main elements: digital relief modeling and statistical analysis (e.g. Lock and Harris 1992).

4.1.2. Post-depositional Changes and Their Influence on the Survival of Paleorelief

During the Pleistocene and Holocene, relief was dynamically impacted and the landscape repeatedly remodeled (cf. Czudek 1997). A loess cover was deposited during cold, dry periods, while in climatically more optimal periods (warmer and more humid), the loess sedimentation was interrupted, followed by the beginning of pedogenesis and slope erosion that intensively remodeled slopes.

During this study of settlement pattern, a strong association between sites and geomorphological processes was observed. These processes heavily influenced the preservation of sites located on slopes (as the result of landslides and rainwash) as well as sites located in river valleys (that were covered by alluvial sediments). It is necessary to take into account the influence of these geomorphological processes when studying settlement strategies.

During the 2002 to 2004 surveys, we analyzed in detail the geomorphology and geology of the Spytihněv Site-cluster (Škrdla 2003). All previously referenced finds were reanalyzed and find spots relocated. The area was intensively surveyed and all newly discovered find spots were recorded. All find spots were then located on three-dimensional map, which was then overlain with a geomorphological layer and a geological layer. The geomorphological layer provides information on documented landslide areas, gullies, and springs. The geological layer documents the surviving islands of loess.

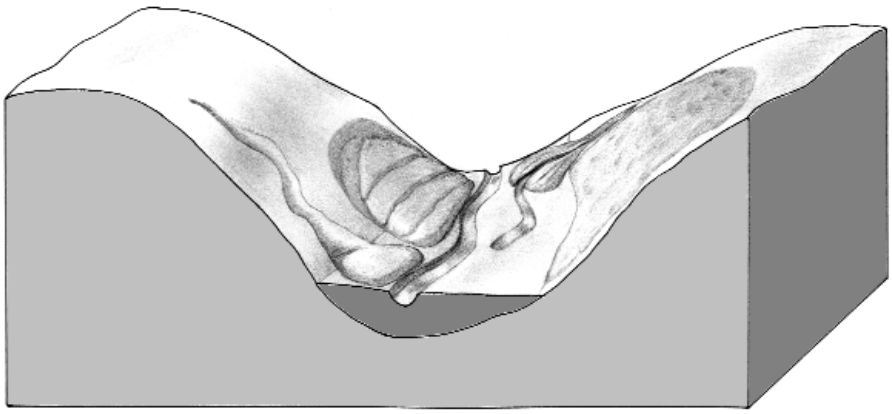


Fig. 4.1. Post-depositional changes – landslides, rainwash and alluvial sediment deposition in river valley bottoms.

4.1.2.1. The Spytihněv-Napajedla Microregion – A Case Study

The extent of the influence of post-depositional changes was studied in detail using the Spytihněv-Napajedla Microregion (Fig. 4.2. and 4.3.). This microregion was selected because of the level documentation available and its accessibility in comparison with microregions. The highest point in this microregion is Maková Hill, the summit of which lies at an elevation of 338.1 m. Isolated Aurignacian artifacts were collected in the vicinity of the summit (for details see Napajedla IV, Spytihněv-Maková). From the summit down to approximately 270 m, there is only a thin plow zone that includes sandstone blocks from the underlying weathered bedrock, isolated gravel and colluvial sediments. As often the case within the Uherské Hradiště Area, no loess has survived above ca. 270 m in elevation. On the slopes, i.e. between ca. the 270 m contour line and the foot of the hill, only isolated loess islands are found, separated by loess-free areas, erosional gullies and land-slide zones. The Gravettian surface sites of Napajedla I and II lie above 270 m. The Gravettian site of Spytihněv-Duchonce, excavated in 2003 and 2004 is located within an isolated loess island. The island begins at an elevation of ca. 255 m and occupational traces were uncovered at an elevation between 245 and 248 m. There is a twenty-meter band where the loess has been eroded away beginning an elevation of ca. 240 m and extending down 220 m, where the loess reappears and continues down to the foot of the hill (ca. 190 m). The site is bordered by a deep, narrow gully to the south, and an active landslide area to the north. A number of isolated artifacts together with isolated heavily fragmented fossil bones (indicating their original position in loess) were collected on the field road that crosses the landslide zone at an elevation of 245 m. The distance of this find spot (Spytihněv-Nad vinohrady) from the Spytihněv-Duchonce site is 200 m. In addition, a "hunting pit" with fossil bones (Hrubý 1951:69) was excavated directly beneath the Spytihněv-Nad vinohrady find spot in 1938, at the foot of the landslide zone. Other fossil bones were recovered from a cellar dug somewhere below Spytihněv-Duchonce site in 1925 (Hrubý 1951:69), again on at the foot of the hill. Two other find spots were documented in a location at the foot of the hill in the Němeča field, ca. 800 m south of the Spytihněv-Duchonce site (Hrubý 1951:84). The sites located at the foot of this hill are not in a location characteristic for the Gravettian and several interpretations have been presented (e.g. an atypical site, a hunting site, bone deposit, redeposition – for further details see Škrdla and Svoboda 1998; Škrdla and Lukáš 2000; Škrdla 2003). Based on detailed geomorphological and archaeological surveys of the area, I currently prefer following interpretation. These sites contain materials from sites originally located upslope that were redeposited from the slopes to the foot of the hill primarily as the result of landslides. A similar situation may be seen in the Napajedla II-III Site-cluster. While the site of Napajedla II is a surface site located at an elevation of 290 m, the stratified site of Napajedla III is located below Napajedla II in redeposited sediments (block slump) in brickyard near the foot of the hill at an elevation of ca. 220 m. The artifacts were excavated from mixed sediments, most probably redeposited from an area higher upslope. Additional loess islands and landslide zones have been documented between Spytihněv-Duchnce and Napajedla III; however, no further sites have yet been discovered there.

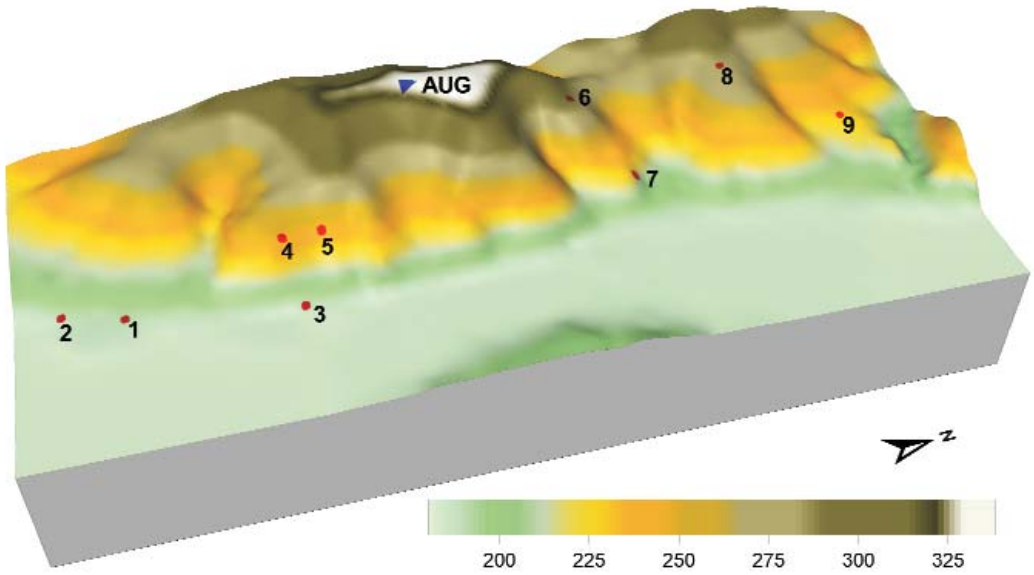


Fig 4.2. The location of sites within the Napajedla Gate. AUG: Napajedla-Maková, 1: Spytihněv-Němeča A, 2: Spytihněv-Němeča B, 3: Napajedla- Podvinohradí, 4: Spytihněv-Duchonce, 5: Spytihněv-Nad vinohrady, 6: Napajedla II, 7: Napajedla-Brickyard, 8: Napajedla I, 9: Napajedla-Jestřabí.

4.1.2.2. Concluding remarks

This study demonstrates the extent of erosion and allows the creation of a model containing three different zones, each of which was affected by different processes. This model has been tested over the whole Uherské Hradiště Area, where the results were validated. It is quite probable that it is to other areas as well.

Hilltops

Hilltops and ridges or crests are characterized by a lack of loess (either the loess sedimentation was limited or the loess has been eroded), and shallow plow zone containing materials removed from the underlying gravels and bedrock.

Slopes

The shape of the slopes has been changed cyclically as the result of loess sedimentation and subsequent erosion. The slopes were covered by calcareous loess and traces of occupation were therefore conserved. However, the slopes were also heavily influenced by solifluction and various types of erosion, e.g. landslides as the result of desiccated, cracked sediments becoming waterlogged and rainwash (this impact of this process has increased as the result of agricultural activities). As a result of these processes, sediments were moved down slope, where may have been deposited several meters lower down, at the foot of slope, or been completely removed.

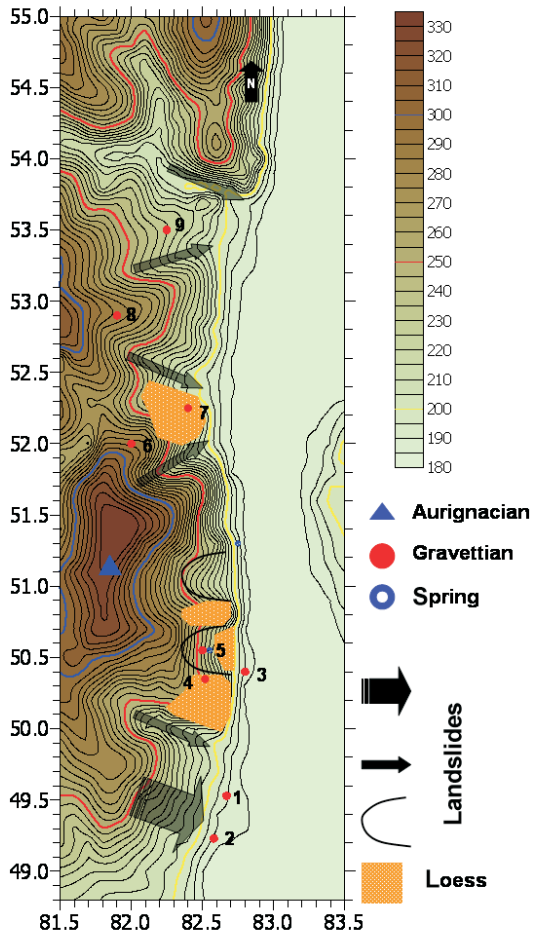


Fig 4.3. Model of the Napajedla Gate

River Valleys

River valleys were filled by alluvial sediments, which is a process proportionally connected to slope erosion. All possible traces of human activities lay beneath several meters of sediments and beneath the groundwater level, meaning that it is technically impossible to excavate them. The extent of alluvial sedimentation can be seen in reports made during the construction of the Baťa Canal and river regulation activities. These reports identified a Hallstatt (ca. seventh to fourth centuries BC) site at a depth of five meters near Kostelany (Hrubý 1948:8), a La Téne (ca. fourth to first centuries BC) site in depth of six meters near Spytihněv (Hrubý 1939:19), and Neolithic and Bronze age horizons (fifth to first millennia BC) at depths of six to seven meters in Staré Město (Zelnitius 1936:4). Any possible Paleolithic remains lie at depths that would make their excavation impossible. The relationship of fossil bones, which have been recovered during gravel (Würmian terrace) exploitation, to any Paleolithic occupation is therefore unknown. However, no worked bone has yet been found.

The limiting factor for the survival of remains from the early phases of the Upper Paleolithic, including the Aurignacian, where the preferred location of sites is on hilltops and ridges (Svoboda et al. 1996; Škrdla 2003), is the degree of loess sedimentation (low) combined with erosion in these areas. No loess cover has been documented on any of these locations across the entire Uherské Hradiště Area and all the sites are only surface sites. Only occasional relicts of interstadial sediments have survived on the slopes, which means that if the slopes were occupied during the Aurignacian, the remains of any sites have been removed and only a minimal possibility of documenting a site on a slope exists.

For the Gravettian occupation, which preferred slopes (Svoboda et al. 1996; Škrdla and Svoboda 1998; Škrdla and Lukáš 2000; Škrdla 2003), slope erosion represents the limiting factor for site survival. The extent of this factor's influence was documented in the Spytihněv-Napajedla Microregion, which may be used as a model case. Here, sites were documented in secondary positions – at the feet of hills – as the result of landslides. Similarly, Klíma (1963a) studied and documented the influence of landslides on Gravettian occupation in the Dolní Věstonice area.

4.1.3. Identifying Sites in a Landscape

4.1.3.1. Theoretical Background

Šimana and Vencl conducted a detailed study of the methodology used for recording archaeological sites in the Czech Republic (Šimana and Vencl 1970; Šimana 1971). They noted the inadequacy of the earlier widely utilized description based on the names of the district, village and field, and parcel number. They did not, however, recommended site identification based on local landmarks. They concluded that the use of absolute coordinates in a selected coordinate system is necessary; however, the archaeological community in the Czech Republic in general did not accept and continues to reject their conclusions.

These authors concluded that for the documentation of archaeological finds is necessary to apply:

- a reasonably accurate,

- a commonly available,

- an easily (i.e. without special technology) and universally applicable

- uniform method for defining a find location.

There are three main systems for the identification of absolute location in the Czech Republic:

- Geographic coordinates, i.e. latitude and longitude (currently the WGS-84 map datum is most widely used),

- The uniform trigonometric S-JTSK cadastral system (often called the "Křovák System"),

- The 1942 coordinate system (S-42) using the Gauss-Krüger delineation.

After 1995, when we started our settlement strategy-oriented research, we were faced with the selection of maps and a coordinate system. There were no geographic coordinates marked on the standard geographic maps (S-JTSK) at that time; coordinates are only present on maps printed after 1996. Therefore, we selected maps from the General staff of the Czechoslovak People's Army (ČSLA), which were available at the Institute of Archaeology in both 1:25,000 and 1:50,000 scales. These maps have since been transformed into tourist maps, which are commonly available in a 1:50,000 scale (published by the Czech Tourists Club, Prague and adapted by the Military Cartographic Institute, Harmanec). Their kilometer grid, which can be equated with three-dimensional Euclidean space using the Surfer program, is suitable for easy digitalization and orientation. There is no problem with conversion into other coordinate systems.

4.1.3.2. History of Site Identification in the Uherské Hradiště Area

Sites within the Uherská Hradiště Area, as is often the case in the Czech Republic in general, were identified in a number of ways in the past. Hrubý (1951) preferred identification using parcel or plot numbers. Although this type of identification seemed very precise, a series discrepancies were observed during our reexamination and Hrubý's identifications cannot therefore be accepted without further reevaluation. There are several reasons for this. In several cases the area defined by the parcel numbers is quite large and the particular site in question cannot be located in greater detail (e.g. Ostrožská Nová Ves-Padělky and Březolupy-Čertoryje); in several cases the parcel numbers are incorrect. Another problem is that Hrubý probably did not place his finds on a map in the field using a geodetic device, but on the table in his office and this identification is understandably imprecise (for example in the case of finds from Spytihněv-Podvinohradí/Napajedla-Podvinohradí, he not only mistakenly identified the parcel number but the cadastral territory as well). In addition, it is necessary to take into account the fact that parcel numbers have changed in the past when parcels were divided, joined or renumbered. This means that one must work with numbering valid at the time of identification. Specifically, for locating Hrubý's sites, the "Stabilní katastr" maps from nineteenth century, which are stored in the Moravian Archives in Brno, were used.

There were sites that were not identified by parcel number, but only by field names and landmarks. Hrubý sometimes identified sites according to local names, which were not printed in maps and, in addition, he worked

with maps, which no longer exist. Elevation markers to which the sites were fixed are often missing or are different from current maps (both in terms of location and elevation). In these cases, German maps dating from the Protectorate of Bohemia and Moravia (Deutsche Heereskarte from 1944-45) were used to locate Hrubý's sites.

There were no problems with the locating of sites published by Klíma (Boršice, Stříbrnice), Valoch („Hostějov", Jarošov), Procházka (Jarošov), Oliva (Napajedla), and Žižlavský (Buchlovice). These sites were located on maps and the location discussed with the individual authors. In addition, the location of these sites was confirmed in the field.

Before we began this project, we identified the location of all the sites using the previously mentioned 1:25,000 scale ČSLA General Staff maps. Since 2002, we have been working with a twelve-channel GPS receiver (eTrex from Garmin). The estimated accuracy of location measurements is five meters or less in open fields. The coordinates are recorded using a WGS-84 map datum; however, for depiction in three-dimensional maps, these coordinates are converted to an S-42 map datum. The sites are identified by only one point, which indicates the estimated center of the site. On the map, the diameter (with that point in center) defines the dimension of the site. However, the diameter may be a function of a number of other variables, e.g. artifact numbers, artifact density, etc.

4.2. Field Survey and Data Analysis

4.2.1 Field Survey

The field survey and the site identification has been an important element of archaeological research since its very beginnings and continues to represent an integral aspect of archaeology today. Czech archaeology after World War II was more focused on other issues and surface surveys were of secondary importance. There are however several exceptions, particularly in the case of Paleolithic archaeology, where Valoch, Klíma, Svoboda, and Oliva coordinated groups of amateur archaeologists, who surveyed selected areas. At the present, some archaeologists are trying to reemphasize non-destructive surface survey methods as a completely valid means of acquiring archaeological information (e.g. Kuna 2000).

It must be stated that Czech archaeologists today within the framework of their three-years grant periods are not able to survey extensive areas because of their limited time, numbers and financial support. Surveys were, are, and will continue to be largely the domain of amateur archaeologists. The results of brief surveys carried out by professional archaeologists, even if guided by theoretical and statistical methods, are not comparable with the results obtained by people surveying a limited area for many years. This has been tested in the Vyškov Gate, where Miroslav Daněk surveyed an area of several dozen square kilometers and discovered several important sites. When several professional archaeologists (including myself) visited these sites, they were not able to find any artifacts. However, Daněk's intensive survey, often lasting a whole day and occurring several times per year, resulted in the collection of artifacts (cf. Svoboda 1994c). Dalibor Kolbinger, a long-time supporter of amateur archaeology, has developed a sophisticated method of systematic surface surveys (Kolbinger 1995). He identified three main phases of a survey: orientation survey, prospecting and collecting (spatial definition of the site, confirming the number of artifacts that permit a cultural determination). On the other hand, there are several negative factors speaking against an unconditional acceptance of amateur archaeologists – they have no connection to museums or the Institute of Archaeology, no appropriate means of publishing materials and results, there is no control over the material after the collector's death, and issues relating to the sale of artifacts.

The most important and limiting factors for the use of the surface survey is accessibility and surface conditions. We are only able to carry out surface surveys in agriculturally-utilized fields that are periodically plowed. The surveying of built-up, forested, grassy or fields sown in perennial plants is impossible. The surveying of private property (particularly gardens) is difficult and depends on an agreement with the owner. Another important factor is geological and concerns the type of surface deposits – artifacts may be still within an intact loess layer deep below the surface. If that surface has not been disturbed, they will not be present on the surface to be collected. There are also many cases where the path of the archaeological horizon does not mirror the current surface and as a result a portion of the archaeological horizon may be exposed and disturbed (referred to here as "Absolon's window"). Block sliding and vertical block movement are often the cause for this exposure. Another factor is the burying of artifacts under colluvial sediments, in particular near hill bottoms. A very important factor is terrain modifications, particularly construction activities, deep plowing in the establishing of vineyards, and slope terracing.

The construction activities may uncover artifacts hidden deep in deposits, as was the case at Jarošov-Kopaniny, where artifacts were recovered during the construction of a tennis court. The deep plowing for vineyards – up to 60 cm – uncovered artifacts from an intact loess horizon in Boršice-Chrástka. Slope terracing heavily disturbed intact layers at the sites of Boršice-Chrástka and Tučapy-Koukolky. On the other hand, other sites were only discovered as a result of these damaging-producing activities – Jarošov-Podvršťa as the result of inappropriate agricultural methods that resulted in intensive slope erosion and Spytihněv-Duchonce where the cause was the plowing under of sunken road baulks.

Secondary sites created by sediment redeposition (in either the past or present) are another problem. Loess from brickyards and quarries was used for industrial purposes and the unusable waste – including artifacts and bones – was deposited elsewhere. The location of this deposition may remain unknown (it may have been spread on fields as a phosphate fertilizer); many village houses were constructed using sun-dried bricks and when the houses were destroyed, the rubble was removed elsewhere. Loess was also used for as landfill in wetland areas (e.g. Kněžpole) and in the construction of road and bridge embankments (Napajedla).

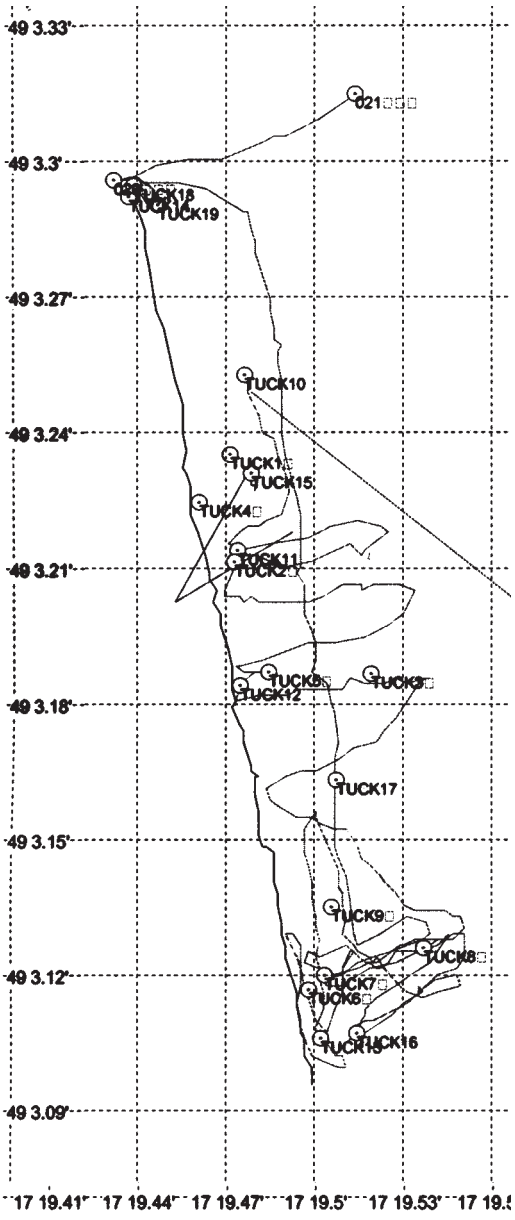


Fig. 4.4. Field survey report from Tučapy-Koukolky including recorded waypoints (artifacts) and survey routes.

Brickyards, where loess quarrying removed entire loess banks are a specific problem. However, quarrying brought to light artifacts hidden deep in the loess. So we have a situation where on one hand sites were being discovered and on the other, they were destroyed before they could be subject to archaeological excavations.

There is another rather more curious issue, which concerns the use of dung as field mulch. Farmers collected important artifacts from fields; these would then often be discarded and as waste would be dumped on the dung pile and the taken out to fertilize the fields. This is probably what resulted in the loss of several private collections after their collectors' deaths.

The specific conditions found on each particular survey also play an important role. These include the depth of the plowing, the intensity of rainfall, light conditions, etc. In other words, no artifacts may found on known sites if the conditions are unfavorable. For this reason, it is necessary to repeat surveys.

Taking into account all the above-mentioned aspects of surface survey, the following methodology was used in our survey project. The first step was to locate all known sites on a map, their locations where analyzed, and the characteristic vectors for each particular culture (Aurignacian and Gravettian) were then defined. The second step was the preparation of a surface survey plan. There are two kinds of surface surveys – systematic and goal-directed. The systematic survey is the complete surveying of selected areas. On this project, these selected areas were the cadastral territories of following villages: Jarošov, Mařatice, Mistřice, Březolupy, Spytihněv, Kudlovice, Traplice, Boršice, Tučapy, etc. (cf. Chapter 3). Goal-directed surface survey is aimed at relocating previously known sites identified only by field names and where the precise location is unknown. The goal-directed surface survey such covers areas selected on the basis of characteristic vectors, i.e. spots showing similar characteristic to known sites. During the surveys, lost sites were also relocated. Each discovered or rediscovered site was associated with a characteristic vector, which led to the further refinement of that vector.

4.2.2. Localities Database

A database of localities, both previously known and newly discovered, has been created within the framework of the current project. During the reanalysis of collections deposited in local museums, two problems that influenced the significance of individual collections were observed. The first problem are missing or lost artifacts, the second problem is the mixing of collections. Material from the Uherské Hradiště Area has been affected by several disastrous incidents. The first of these was the loss of dozens of artifacts during World War II when they were sent to Brno for study (Hrubý 1951:90). A second incident is the 1954 closing of museums in Velehrad (materials were moved to Uherské Hradiště) and Napajedla (materials were moved to Zlín). Each movement and reinventory of these collections also resulted in the loss of several items. It was not only artifacts that were lost, however. The archaeological reports have also been lost in some cases. Collections located in local schools were also lost after World War II. The catastrophic flooding of the SM UH in 1997 had a most devastating effect on its collections, when all materials stored in the museum basement were under water. The sloppy reinventory of the flooded items carried out by Jiří Pavelčík and the resulting mistakes has further decreased the significance of the SM UH collections. The original inventory numbers were rewritten and artifacts with damaged or unreadable inventory numbers were placed in the bags using the scheme "patinated artifacts in the Paleolithic bags, non-patinated in the Neolithic bags." Fortunately, Skutil (1940), Hrubý (1951), and Oliva (1998a) described selected finds in detail and illustrated several artifacts, which made it possible to identify them. This provided conclusive evidence of the manipulation of the inventory numbers. In particular, this concerns the following artifacts:

- An endscraper, Inv. No. SF 14651 from Staré Město (Hrubý 1951: 90, obr. 10:1) is currently associated with Boršice-Chrástka with a new inventory number, SF14697;

- A retouched artifact published by Oliva (1998a, obr 17:21) as a find from Boršice-Chrástka is currently affiliated to Tasov under new inventory number, SF 14749;

- A blade from Spytihněv-Němeča, Inv. No. SF 803 is missing, inventoried in its place is a fragment of another blade from the same site;

- Another documented manipulation is the affiliation of geological samples described as flint from dunes near Hamburg, Germany, to several prehistoric knapped industry collections.

The database of sites that has been created during this project is based only on verified information. In addition, problematic sites are identified and the fact that they have not been verified is noted.

4.2.3. Relief Digitalization and Visualization

The relief maps were digitized in the Surfer (Golden Software) program, a suitable and inexpensive solution for three-dimensional terrain and archeological modeling, quite comparable to professional GIS systems. Surfer allows the drawing of images, shadowing, contours, 3-D grid frames and surface maps. These maps may be combined and overlain by a number of post maps (including classed post) containing additional information.

The post maps are used to identify sites on a surface map. It is possible to change colors or symbols according to cultural affiliation or change a symbol's dimension (classed post) reflecting the site dimension, number of artifacts, etc. The classed post is a useful tool for intrasite analysis. The related circle post maps were used for a spatial distribution analysis of selected artifacts (see Chapter 2).

The Surfer program works in three-dimensional Euclidean space, which must be constructed from two-dimensional printed maps. We compared different methods of digitalization and we prefer to digitize using a regular grid in order to take advantage of S-42 coordinates printed on the map. For digitizing the map of the entire Uherské Hradiště Area, we use a step (the distance between two neighboring points) of 250 meters, for digitizing microregions we used a 100-meter step. In another words, the map of the whole Uherské Hradiště Area, i.e. an area of 30 by 30 km consists of ca. 15,900 digitized points. This method consists of drawing a grid on the map and manually taking Z values from the intersecting points of the grid. When the database of X, Y, and Z values is created, Surfer needs to create the grid file. Here, we used the default method – Kriging. The three-dimensional map was created using the surface map function.

The site coordinates were recorded in the field using a WGS-84 map datum and then converted into an S-42 map datum. The database of sites was overlain on the surface map, red rings were used for Gravettian sites, blue triangles for Aurignacian sites, and small black dots for sites with an uncertain affiliation. In maps of the microregions, the symbol size reflects the site dimension.

4.3. The Gravettian Settlement Strategy

Gravettian sites are not randomly dispersed on the landscape but respect the relief of Moravia (e.g. Svoboda 1995a; Svoboda, Ložek and Vlček 1996; Škrdla and Svoboda 1998; Škrdla and Lukáš 2000; Škrdla 2003). They are concentrated along a north-south axis, from the Danube River in the south along the Morava River, through the Napajedla and Moravian Gates and following Odra River to the Poland. They are concentrated in four main areas, Dolní Věstonice-Pavlov, Uherské Hradiště, Předmostí, and Petřkovice.

4.3.1. The Gravettian Settlement Structure in the Uherské Hradiště Area

Gravettian sites are located on the margins of highlands within sight of the Morava River. The sites within the Uherské Hradiště Area are distributed in a chain, which begins at the Napajedla Gate and follows along both banks of the Morava River. These settlements may be separated into two microregions (Jarošov and Spytihněv-Napajedla), and several isolated sites – Boršice, Ostrožská Nová Ves, Pohořelice, and Kunovice. The two latter sites are most probably Epigravettian. In the framework of this project, the Uherské Hradiště Area was studied in detail.

Jarošov Microregion
A cluster of sites within the cadastral territory of Jarošov and its vicinity consists of the sites of Jarošov-Podvršťa, Jarošov-Kopaniny, which is two concentrations of faunal remains with isolated artifacts, the small site of Kněžpole-Hrádek, and isolated finds from Mařatice-Kolébky. The sites are located on the slopes of the steep hills Černá Hora and Rovnina.

The largest site is Jarošov-Podvršťa, which lies on the northwestern slope of Černá hora, whose summit is at an elevation of 302 m. The elevation of the site is 245 m and the spot allows the control of a wide area of the river basin including the southern entrance to the Napajedla Gate. The remains are distributed over an area with a diameter of ca. 50 m and the site may be classified as a medium-sized locality.

Two concentrations of faunal remains with isolated stone artifacts – Jarošov-Kopaniny – were excavated some 200 m to the south and ca. 20 m downslope from the main site described above, separated from Jarošov-Podvršťa by a shallow erosional gully.

The small surface site of Kněžpole-Hrádek is located on a crest jutting in a northerly direction from the slope of a Rovnina Hill, whose summit is at an elevation of 336 m. The elevation of the site is 220-230 m. The artifacts were thinly distributed over an area 50 m in diameter and the site may be classified as small-sized site or the remnant of an eroded site.

A small collection of artifacts was collected in Mařatice-Kolébky on the edge of blind valley on the southern slope of Rovnina Hill. The elevation of the site is 250 m. The artifacts were thinly distributed over an area with a diameter of 250 m and the site may be classified as an occasional site or the remnant of an eroded site.

Only Jarošov-Podvršťa and Kopaniny yielded a material for a series of ^{14}C dates. These dates indicate that the former dates to the Pavlovian stage, while the latter is from the Willendorfian-Kostenkian stage of the Gravettian.

Spytihněv-Napajedla Microregion
A cluster of sites within the cadastral territories of the Spytihněv and Napajedla consists of ca. ten sites located on five kilometers of the eastern slopes above the right bank of the Morava River in the Napajedla Gate. In the following paragraphs, the sites are described from south to north. Only the sites Napajedla-Brickyard, and Spytihněv-Duchonce yielded ^{14}C dates.

Hrubý documented three find spots at the foot of a hill, whose summit is at an elevation of ca. 300 m. The elevation of the find spots is ca. 188 m, and this location allows control of the southern entrance to the Napajedla Gate. Two find spots, including stone artifacts and faunal remains, were located in the Němeča field, the third, which yielded only faunal remains, is in the Podvinohradí field.

The site of Spytihněv-Duchonce lies on the eastern facing slope of Maková Hill, whose summit is at an elevation of 338.1 m. The elevation of the site is 245-248 m. The site may be classified as medium-sized site, ca. 15 m in diameter.

The site of Spytihněv-Nad Vinohrady is located directly above Hrubý's concentration of faunal remains in the Podvinohradí field. The elevation of this site is 250 m.

The site of Napajedla II is located on a ridge jutting in a northeasterly direction from the slope of Maková Hill, whose summit is at an elevation of 338.1 m. The elevation of the site is 290 m and the spot allows control of the Napajedla Gate. The artifacts were distributed over an area with a diameter of ca. 50 m and the site may be classified as a medium-sized site.

The site Napajedla III-Brickyard is located lower on the same slope, at an elevation of ca. 205-220 m. This site yielded several different collections of artifacts. These artifacts were collected from redeposited sediments. The site may have been connected with Napajedla II located further upslope.

One kilometer to the north from the site of Napajedla II is another important site, Napajedla I-Šardica. The site is located on a ridge jutting in an easterly direction from the slope of a hill, whose summit is at an elevation of 364 m. The elevation of a site is between 270-295 m and the spot allows control of the Napajedla Gate. Based on the spatial distribution of artifacts, the site may consists of several units, partly overlaying each other. The artifacts were distributed over an area with diameter of ca. 250 m and the site may be classified as medium-sized site.

In addition, Oliva (1998a) mentions other small sites with non-diagnostic artifacts within the Spytihněv-Napajedla Microregion: Napajedla V, VI, VIII.

Boršice-Chrástka
The site is located on the right bank of the Morava River, on the northeastern slope of the steep Tučapy Hill, whose summit is at an elevation of 340 m. The elevation of the site is 255-270 m, and the spot allows control of a wide area of the river basin. The artifacts were collected over an area with a diameter of ca. 100 m and the site may be classified as a medium-sized locality. An isolated artifact was collected down slope from Chrástka at a distance of ca. 750 m.

Ostrožská Nová Ves-Padělky
The site is located on the left bank of the Morava River, on a slight elevation close to the foot of the western slope of a hill, whose summit is at an elevation of 250 m. The elevation of the site is 190 m, and the spot allows the control of a wide area of the river basin. The site is ca. 100 m in diameter and may be classified as a small-sized locality.

Pohořelice-Čtvrtky
A series of artifacts was collected on the left bank of the Morava River somewhere one the northwestern slope of beneath the Klíny Elevation Marker (299.7 m). The elevation of the site may be between 225-265 m. The site may be classified as a small-sized locality.

Kunovice-V úzkých
A series of artifacts was collected on the left bank of the Morava River on the northwestern slope beneath the Hlaviny Elevation marker (288.3 m). The elevation of the site is 232 m and the spot allows the control of the Morava and Olšava rivers confluence. The site is ca. 50 m in diameter and may be classified as a small-sized locality.

Tab. 4.1. Basic data of the above mentioned localities. The significant values are in hatched cells.

Microregion	Site	Stratified/Surface (* - ^{14}C available)	Cultural Affiliation	Location					Site Diameter – Φ [m]	Artifact Number – ($1*10^X$)
				Elevation ASL	Relative Elevation	Landmark	Strategic Position – V,G,C	Orientation		
Jarošov	Jarošov II-Podvršťa	Str*/Sur	Pav.	240-247	66-73	Černá hora - Rovnina	V,G	NW	50	3
	Jarošov II-Kopaniny (Procházka)	Str*	W-K	225-228	51-54		V,G	NW	5	1
	Jarošov II-Kopaniny (Valoch)	Str*	W-K	225-228	51-54		V,G	NW	5	1
	Kněžpole-Hrádek	Sur	Gvt.	220-230	44-54		V,G	NW	50	1
	Mařatice-Kolébky	Sur	Gvt.	250-270	76-96		V, C	SW	250	1
Spytihněv-Napajedla	Spytihněv-Němeča a	Str	Gvt.	188-189	8-9	Napajedla Gate, Maková Hill	V,G	E	15	1
	Spytihněv-Němeča b	Str	Gvt.	188-189	8-9		V,G	E	5	1
	Spytihněv-Duchonce	Str*/Sur	W-K	245-248	65-68		V,G	E	15	2
	Spytihněv-Nad vinohrady	Str?/Sur	Gvt.	240-245	60-65		V,G	E	10?	1
	Napajedla I	Sur	Gvt.	270-295	90-115		V,G	E	250	3
	Napajedla II	Sur	Gvt.	285-295	105-115		V,G	NE	50	2
	Napajedla III (north)	Str*/Sur	W-K	205-215	25-40		V,G	NE	15	2
	Napajedla III (south)	Str/Sur	Gvt.	210-220	30-40		V,G	NE	20	1
	Napajedla V-Jestřabí	Sur	Gvt.	228-232	48-52		V,G	NE	100	0
isolated sites	Boršice-Chrástka	Str*/Sur	Pav.	255-270	82-97	Tučapy Hill	V,C	NE	100	3
	Boršice-Chrástka a	Sur	Gvt.?	210-215	37-42		V,C	NE	-	0
	Ostrožská Nová Ves-Padělky	Sur	Gvt.?	185-195	12-22	-	V,C	NW	100	2
	Pohořelice-Čtvrtky	Str?/Sur	Egvt.?	225-265	45-85	-	V,G,C	NW	?	1
	Kunovice-V úzkých	Sur	Egvt.?	230-235	56-61	-	V, C	NW	50	1

Key:
Cultural Affiliation: Gvt. – Gravettian (generalized), Pav. – Pavlovian, W-K – Willendorfian-Kostenkian, Egvt. – Epigravettian
Strategic Position: V – Control of the river valley, G – Control of the valley gate, C – Control of confluence
Orientation: NW – Northwest, NE – Northeast, E – East, SE – Southeast facing slopes
Significant values are in hatched cells.

4.3.2. A Definition of the Gravettian Settlement Strategy

In the preliminary studies of settlement geography (Škrdla and Svoboda 1998; Škrdla and Lukáš 2000), we specified eight common characteristics for the Gravettian settlement strategy within the Uherské Hradiště Area:

1. Location along an important river

2. Location on major features (landmarks) in the landscape

3. A strategic position which allows:

    a) Control of the river valley

    b) Control of the valley gates

    c) Control of the confluence of important rivers

4. The prevailing northerly orientation of the site

5. On the slope of a hill (usually with a summit at an elevation over than 300 m)

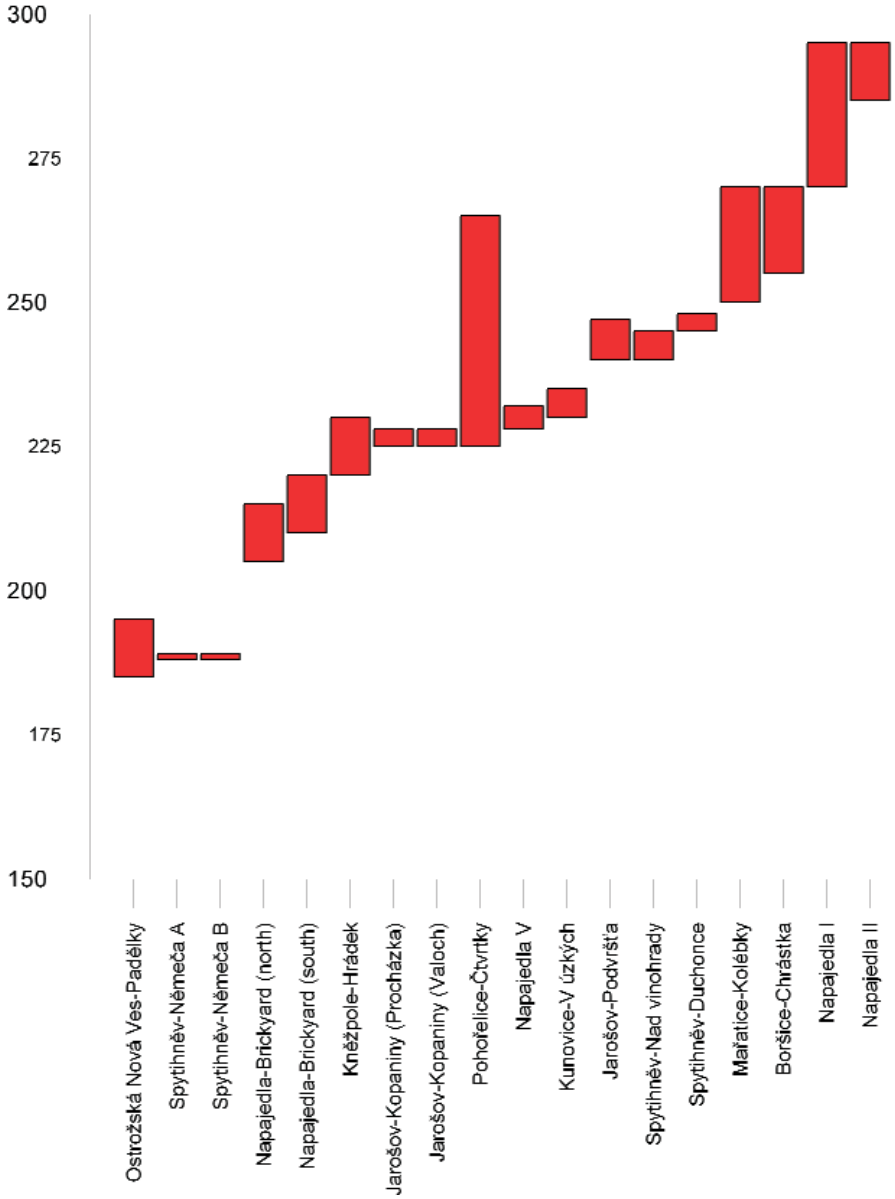
6. The elevation of the sites ranging between 200 and 290 m

7. The relative elevation ranges between 10 and 100 m above the present river level

8. Small streams and springs in the vicinity

4.3.3. A Discussion on the Gravettian Settlement Strategy

When analyzing sites within the Uherské Hradiště Area using the above-mentioned characteristics, the following conclusions may be drawn. All sites are located along an important river – the Morava River. The majority of sites lie on a major feature in the landscape. In the case of the Jarošov Microregion this is Černá hora-Rovnina Hill, in the case of the Spytihněv-Napajedla Microregion, this is the Napajedla Gate. Additionally, Spytihněv sites are on the slope of Maková Hill, Boršice-Chrástka on Tučapy Hill, and Pohořelice-Čtvrtky in the Napajedla Gate. There is no significant landmark in the cases of Ostrožská Nová Ves-Padělky and Kunovice-V úzkých. However, these sites are located on a hill and in addition are near the confluence of the Morava and Olšava rivers.



Graph 4.1. Elevations of Gravettian Sites (sorted by minimum elevations).

All the sites are located in strategic positions in the landscape that allow control of the Morava River valley. All the sites in the Spytihněv-Napajedla Microregion and the site of Pohořelice-Čtvrtky allow control of the Napajedla Gate, and all the sites in the Jarošov Microregion with the exception of Mařatice-Kolébky allow control of the southern entrance to the Napajedla Gate. Mařatice-Kolébky, Ostrožská Nová Ves-Padělky and Kunovice-V úzkých allow control of the confluence of the Morava and Olšava rivers, Boršice-Chrástka the confluence of the Morava and Dlouhá rivers, and Pohořelice-Čtvrtky the confluence of the Morava and Dřevnice rivers.

The sites are often located on northwest- or northeast-facing slopes. The only exceptions are the site of Mařatice-Kolébky located on a southeast-facing slope and a series of east-facing sites inside the Napajedla Gate (however, the Spytihněv-Němeča sites are redeposited and Spytihněv-Duchonce lies on very shallow northeast-facing slope). The interpretation of this phenomenon is problematic. One possible explanation is that the northern exposure of the sites may be connected with a desire to reduce the amount of sunlight, resulting in the more limited melting of the surface under permafrost conditions.

The sites in this area may be separated in four groups according to their elevations. The first group are foot-of-hill sites, including the Spytihněv-Němeča and Napajedla-Brickyard sites. Their low position is interpreted as being the result of landslides and the original position of these materials is presumed to have been somewhere upslope. It should be mentioned that partial down slope redeposition is possible for all sites. The second group represent sites located in the vicinity of the 225-m contour line, some of which are classified as Upper Gravettian (Jarošov-Kopaniny, probably Kněžpole-Hrádek), others as Epigravettian (Kunovice-V úzkých). The third group of sites is concentrated around the 250-m contour line and these sites may be classified as Pavlovian (Jarošov II-Podvršťa; Boršice-Chrástka lies slightly higher). There are more highly-situated sites in the Napajedla Gate – Napajedla I and II. However, these sites yielded no dates and cannot currently be culturally classified. Their higher location may be dictated by the local terrain.

Although Pleistocene springs and small streams are still difficult to identify, there are several indicators that allow them to be traced. The salty, sulfuric spring Slanica is in Napajedla (another salty spring is found near the site of Zlín-Louky, ca. 10 km to the northeast of Napajedla) and a sulfuric spring is found in Ostrožská Nová Ves (still exploited as a spa). Bárta (1980) hypothesizes the utilization of warm springs at the Moravany (Slovakia) sites. Small streams in gullies running from slopes perpendicular to the Morava River shaped the slopes and created natural traps allowing hunting.

Tab. 4.2. Basic data for other Gravettian sites.

Mikro-region	Site	Stratify/Surface (* - ^{14}C available)	Cultural Affiliation	Location					Site Dimension – Φ [m]	Artifact Number – ($1*10^X$)
				Elevation ASL	Relative Elevation	Landmark	Strategic Position – V,G,C	Orientation		
DV - Pavlov	Dolní Věstonice I	Str*	Pav.	190-235	20-65	Pavlov Hills	V,G	NE	300	5
	Dolní Věstonice II	Str*/Sur	Pav.	200-240	30-70		V,G,C	N	200	5
	Dolní Věstonice III	Str*/Sur	Pav.	215-230	45-60		V,G	N	100	3
	Pavlov I	Str*/Sur	Pav.	190-205	20-35		V,G	NE	100	6
	Pavlov II	Str*	Pav.	205-220	39-54		V,G	NE	100	3
	Pavlov III	Sur	Pav.	180-200	14-34		V,G	NE	100	1
	Milovice I	Str*	Pav./W-K	240	74		V	NE	100	3
Pre	Předmostí I	Str*	Pav.	220	10	Skalka	V,G,C	E	300	4
	Předmostí II	Str*	Pav.	225	15	Hradisko	V,G,C	E	10	1
P	Petřkovice Ia	Str*	W-K	248	50	Landek	V,C	NE	100	3
A	Grub/Kranawetberg (Austria)	Str*/Sur	Pav.	196	36	-	V	S	150	3

The analysis demonstrates a strong association of Gravettian localities with Features 1-8. These results support the hypothesis arguing in favor of a high degree of standardization for the Gravettian settlement strategy. An interregional comparison shows similarities with other settlement areas, including Dolní Věstonice-Pavlov, Předmostí, Petřkovice (all in Moravia), Grub/Kranawetberg in Austria (90 km to the southwest of Uherské Hradiště; Nigst 2004), the Moravany Area (50 km to the southeast from Uherské Hradiště; cf. Hromada 1998), Hungary (Dobosi 1994), and Russia (Kostenki-Borschevo microregion).

4.4. The Aurignacian Settlement Strategy

The sites that may be attributed to the Aurignacian are dispersed on both banks of the Morava River, at greater distances from the river in comparison to Gravettian sites. The Aurignacian sites are located on the boundary of two zones – river valley and highland. Often they are already in the highlands, although not deep into them and they are often located in a secondary valley, i.e. that of a Morava River tributary.

No stratified or absolutely dated Aurignacian sites have as yet been identified in the Uherské Hradiště Area. Therefore sites are attributed to the Aurignacian on the basis of typological characteristic, in particular the presence of carinated (steeply retouched) endscrapers, polyhedral burins and steeply retouched (Aurignacian) blades. Given the raw material and typological differences among the particular sites and the differing locations of the sites, it may be asserted that the Aurignacian occupation displays no uniform material culture and covers a longer time span. Groups associated with the Aurignacian probably occupied the Uherské Hradiště Area for a longer period and may well be possible to identify and separate them into several distinct subcultures in the future. However, these issues cannot be yet be resolved using only the surface material available for study. These facts led Klíma (1978) to determine the characteristics common to these collections and use them to define the Morava-type Aurignacian. The Morava-type Aurignacian industry is made predominately from imported materials and its typology is characterized by the presence of carinated and nosed endscrapers, lower amounts of polyhedral burins, a infrequent flat worked tools (including leaf points) and rare microlithic implements. Because of similar settlement strategies throughout that period, some collections probably represent a mixture of several occupational phases, which cannot be separated. The Aurignacian time span may, theoretically, cover a the period 35-30 kya (uncalibrated). However, taking into account dates from Lower Austria (Langsmannersdorf/Perschling, Alberndorf and Hornu/Raabserstraße; Neugebauer-Maresch 1993), similar industries may had continue until to ca. 20 kya. Another indicator for relatively late dates are wedge-shaped microblade cores, known in broader Euro-Asian context after 25 kya (cf. Svoboda 1995b). In another words, the coexistence of the Late Aurignacian and Gravettian in the Uherské Hradiště Area is possible (Škrdla and Lukáš 2000). There is a series of other, probably Aurignacian sites (based on their location). However, in the following list only sites, which yielded characteristic tools allowing attribution to the Aurignacian are discussed.

4.4.1. The Gravettian Settlement Structure in the Uherské Hradiště Area

Right bank sites (from north to south)
Napajedla-Maková is a strategic hilltop site located on Maková Hill, which forms the western margin of the Napajedla Gate. The elevation of this site is between 320-338 m. The site yielded a nosed Aurignacian endscraper.

Kudlovice-Za Hradskou (including the find spots "A," "B," "C") is located on a ridge jutting southeast from the main crest of the Chřiby Hills. The site is composed of several units; the distance between them ranges up to 350 m. The elevations of these sites are between 294-300 m. All the find spots yielded characteristic Aurignacian tools.

Traplice-Bukáčová is located on the southeastern-facing slope of Bukáčová Hill, only 200-600 m from its summit. The elevation of this site is between 325-335 m. The site yielded a collection of carinated and nosed endscrapers.

Traplice-Kopaniny is located below the site of Bukáčová, on a shallow ridge jutting out from Bukáčová Hill. The elevation of this site is between 315-318 m asl. The site yielded a carinated endscraper.

Buchlovice-Chrastě is a hilltop site located at a high elevation, 380-391 m. The site yielded retouched blades, a combination of a burin with a bec, and a multiple burin.

Buchlovice-Ploskárně is located on a ridge jutting out from Chrastě Hill at an elevation of 340-355 m.

Boršice/Buchlovice-Elevation Marker 331 is a hilltop site located in the highlands, however, within sight of the Morava River valley. The elevation of this site is between 310-330 m. The site yielded a collection of Aurignacian artifacts including carinated and nosed endscrapers, steeply retouched blades and polyhedral burins.

Stříbrnice-Hořístky is located on a ridge jutting out from an unnamed hill relatively deep in the highlands. The elevation of this site is 315-325 m. The site yielded a collection of Aurignacian artifacts.

Stříbrnice-Kuče is located in a position similar to Hořístky. The elevation of this find spot is 300-335 m. The site yielded an endscraper.

Boršice-Hlaviny is located on the eastern slope of Tučapy Hill not far from the summit. The elevation of this find spot is 303 m. The site yielded a carinated endscraper.

Tab. 4.3. Basic data of the above mentioned localities. The significant values are in hatched cells.

site	Bank	% of Erratic Flint	ES/B Ratio	Location				Site Dimension – Φ [m]	Artifact Number – ($1*10^X$)
				Elevation ASL	Morava River Valley (from an elevation 200 m)	Strategic Position – MV,SV,G,C,H	Terrain Position		
Bílovice/Nedachlebice-Nad vinohrady	L	71	1:0	300-313	4	SV,H	Ridge	300	1
Boršice-Hlaviny	R	100*	1:0*	303	2	MV,SV,C	Ridge	-	0
Boršice/Buchlovice-code 331	R	70	1:1.05	310-330	4	MV,SV,C,H	Hilltop	600	3
Březolupy-Čertoryje	L	65	-	280-289	4.5	SV,H	Hilltop	200	1
Březolupy-Čertoryje a	L	100*	0:1*	272-288	4.5	SV,H	Hilltop	300	0
Buchlovice-Chrastě	R			380-391	7	SV,H	Hilltop	150	1
Buchlovice-Ploskárně	R			340-355	6	SV,H	Ridge	50	0
Kudlovice-Za Hradskou	R	67	1:0.78	294-297	2	SV,H	Ridge	150	2
Kudlovice-Za Hradskou a	R	82	1:0.60	294-297	2	SV,H	Ridge	20	1
Kudlovice-Za Hradskou b	R	60*	1:0*	295-296	2	SV,H	Ridge	20	0
Kudlovice-Za Hradskou c	R	100*	1:0*	298-300	2	SV,H	Ridge	20	0
Napajedla-Maková	R	100*	1:0*	320-338	1	MV,SV,G,H	Hilltop	400	0
Osvětimany/Žeravice-Hrušková	R		1:1	370-383	7	SV,H	Hilltop	500	2
Podolí-Strážné	L	39	1:0*	320-331	4	SV,C,H	Ridge	300	1
Stříbrnice-Hořístky	R	97	1:0.14	315-325	5	H	Ridge	50	2
Stříbrnice-Kuče	R	100*	1:0*	310-335	5	SV,H	Ridge	-	0
Topolná-Bukovina	L	69	0:3	285-290	1.5	MV,SV,G,C,H	Ridge	100	1
Topolná-Osičná	L	87	-	260-266	0.5	MV,SV,G,C,H	Ridge	200	1
Traplice-Bukáčová	R	34	1:0.11	325-335	4	SV,H	Ridge	350	1
Traplice-Kopaniny	R	33	1:1*	315-318	3.5	SV,H	Ridge	200	0
Tučapy-Koukolky	R	74	-	320-330	3	SV,H	Ridge	350	1
Tučapy-Nad horkami	R	93	-	336-342	1.5	MV,SV,C,H	Ridge	250	0
Tučapy-Nad panským	R	32	2:0*	325-335	2	SV,H	Ridge	150	1
UH-Jarošov-Rochuz	L	75	1:1.50	300-305	1	MV,SV,G,C,H	Hilltop	150	2

Key:
Bank: L – Left bank of the Morava River, R – Right bank of the Morava River
% of erratic flint and ES/B ratio: * – sample too small
Strategic position: V – Control of the river valley, SV – Control of a secondary valley, G – Control of the valley gates, C – Control of the river confluence, H – Control of the surrounding highland
Significant values are in hatched cells.

Tučapy-Koukolky is located on a crest jutting in north from the of Újezdy Elevation Marker. The elevation of this site is 320-330 m. The site yielded no significant Aurignacian tools, however, the overall character of collection allows its attribution to the Aurignacian.

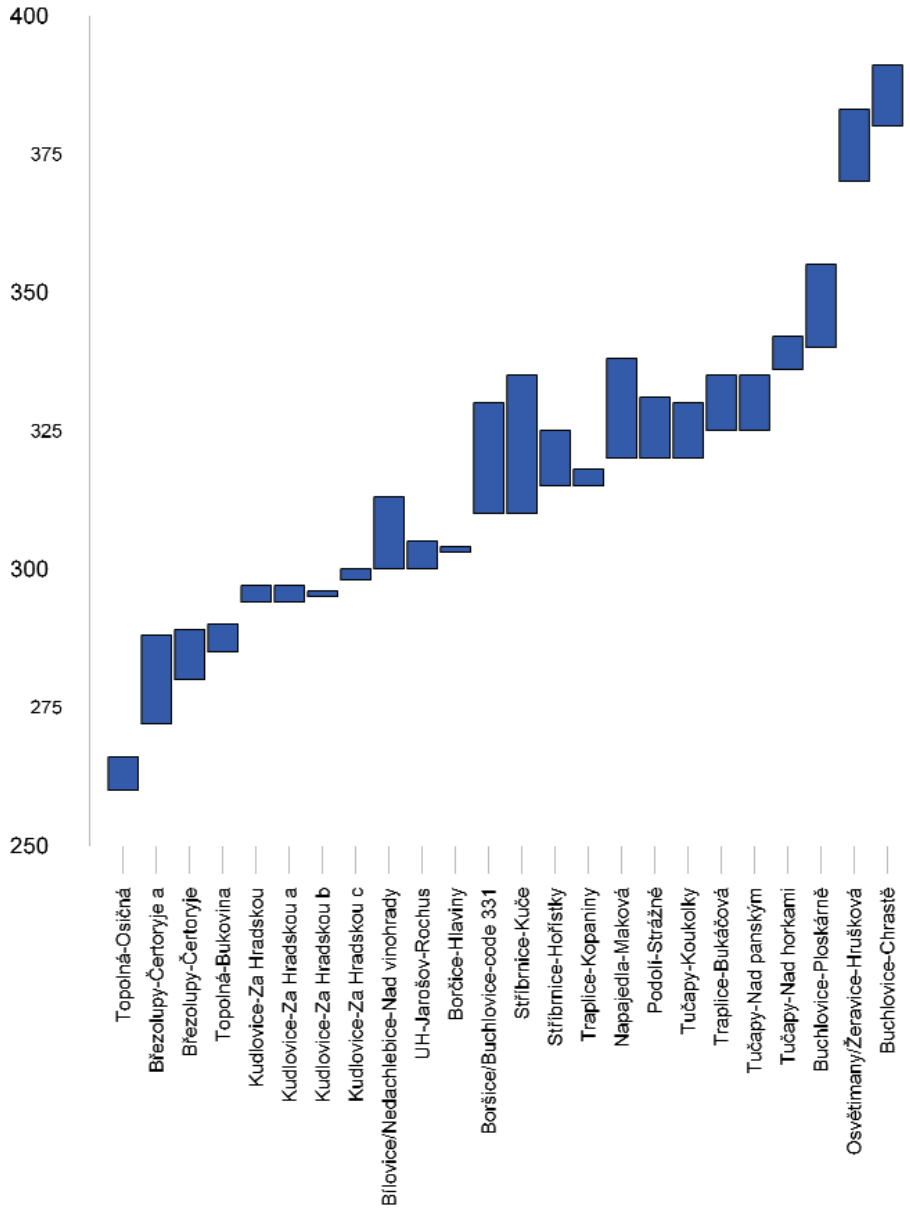
Tučapy-Nad horkami is a hilltop site located on a crest connecting Tučapy Hill with the Újezdy Elevation Marker. The elevation of this site is 336-342 m. The site yielded a polyhedral burin.

Tučapy-Nad panským is located on a northwestern slope, near the top of Tučapy Hill. The elevation of this site is 325-335 m. The site yielded a carinated endscraper.

Left bank sites (from north to south)

Topolná-Bukovina is located on a crest jutting western from Hájiny Hill into the Morava River valley. The elevation of this site is between 285-290 m. The site yielded a multiple polyhedral burin.

Topolná-Osičná is located on the same crest as Bukovina, at an elevation between 260-266 m. This site yielded a fragment of a steeply retouched tool.



Graph 4.2. Elevations of Aurignacian sites (sorted according to maximum elevation).

Březolupy-Čertoryje (including find spot "A") is located on two neighboring hills in the Březnice River valley, which is side valley of the Morava River valley. The elevation of this site is between 280-289 m, respectively 272-288 m (for A). The first site yielded a steeply retouched Quinson-type point and three splittered pieces; the second site – "A" – yielded a burin on a massive blade and a dihedral burin.

Bílovice/Nedachlebice-Nad vinohrady is located on a northwest-facing crest jutting out from Rovná hora. The elevation of this site is between 300-313 m. The site yielded a carinated endscraper and a nosed, steeply retouched endscraper.

Jarošov-Rochuz is a hilltop site located on the margin of the Morava River valley, near the confluence of the Morava and Olšava rivers. The elevation of this site is between 300-305 m. The site yielded a collection of Aurignacian artifacts including carinated endscrapers, steeply retouched blades, and a polyhedral burin.

Podolí-Strážné is located on a northwest-facing crest jutting out from Hluboček Hill. The elevation of this site is between 320-331 m. The site yielded an artifact morphologically between a carinated endscraper and a core.

4.4.2. A Definition of the Aurignacian Settlement Strategy

As is the case of Gravettian settlement strategy, I identified common characteristics for the Aurignacian settlement strategy within the Uherské Hradiště Area, in this case there are only five:

1. Location in the highlands flanking the Morava River, however within sight of Morava River Valley

2. Location on major features (hills and ridges) in the landscape

3. A strategic position which allows:

    a) Control of the main river valley

    b) Control of a secondary valley

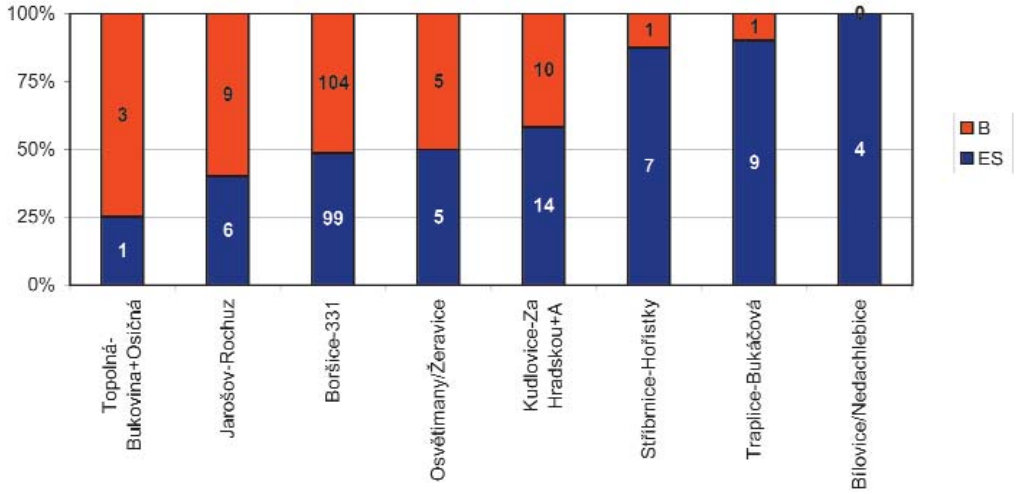
    c) Control of valley gates

    d) Control of the confluence of important rivers

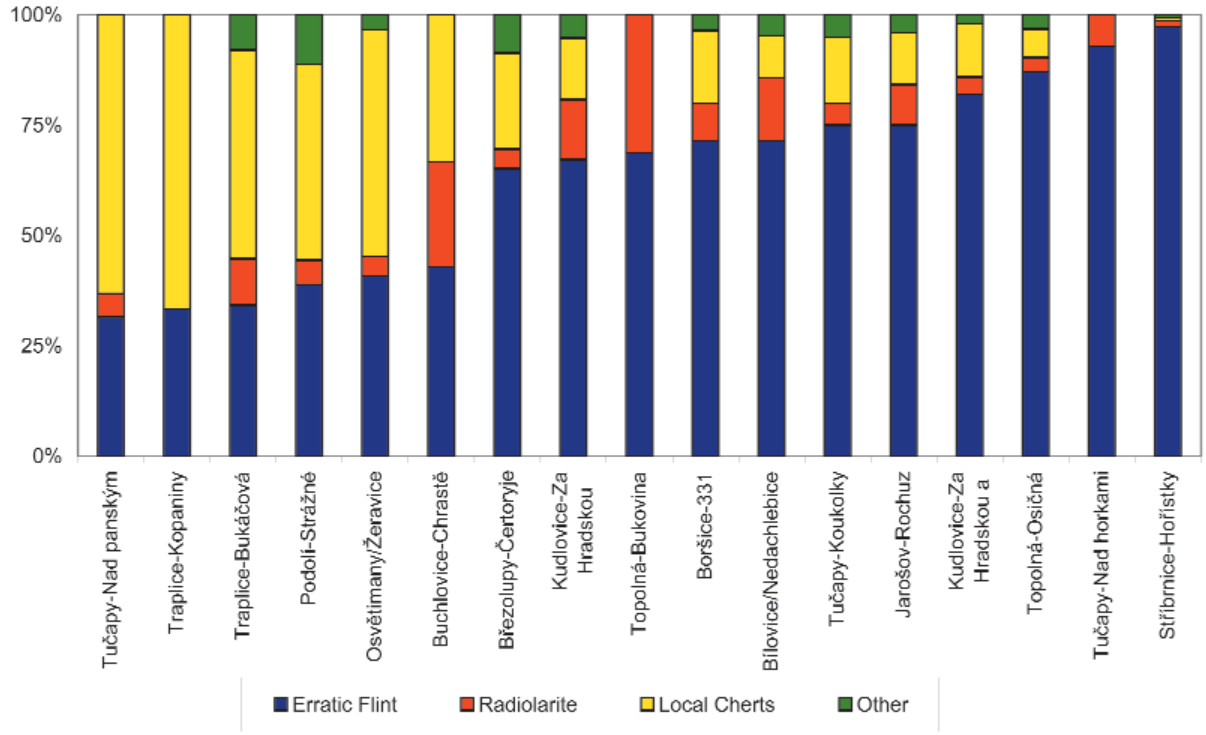
    e) control of the surrounding highlands

4. On a hilltop or ridge

5. The elevation of the sites ranges between 280 and 390 m



Graph 4.3. End scraper/burin ratio from selected Aurignacian sites.

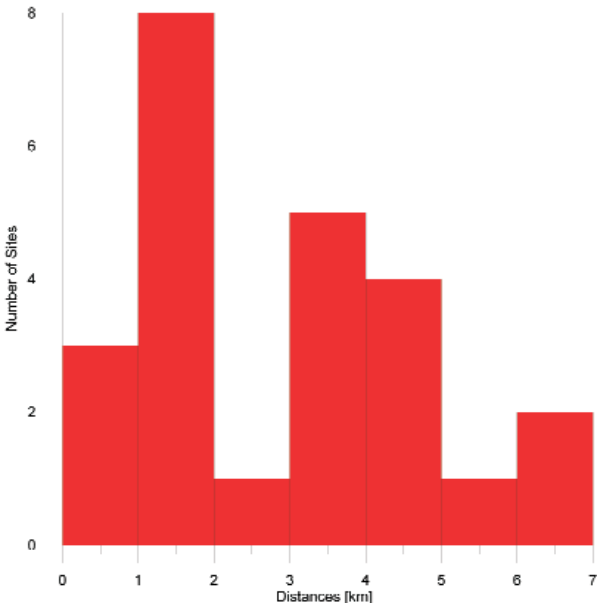


Graph 4.4. Raw materials from selected Aurignacian sites. Note: At sites with a Neolithic occupation component, not all radiolarite was classified and their actual percentages may be in fact higher.

4.4.3. A Discussion on the Aurignacian Settlement Strategy

When analyzing sites within the Uherské Hradiště Area according to the above-mentioned characteristic, the following conclusions can be drawn. All sites are located on the margin of highlands flanking the Morava River. A majority of the sites are found on significant feature in the landscape: on the hilltops or ridges – allowing control of the surrounding countryside, i.e. highlands and valleys. Only a few sites are located on the major hills bordering the Morava River valley, thus allowing control of the Morava River itself. These are: Jarošov-Rochuz on the hill "Černá hora," Topolná-Bukovina and Osičná on a ridge jutting into the valley, Tučapy-Nad horkami and Boršice-Hlaviny on Tučapy Hill, Napajedla-Maková on Maková Hill, and Boršice/Bucholvice-Elevation Marker 331 at the eponymous elevation marker. A majority of the sites allow control of a secondary valley drained by a Morava River tributary. A series of sites allow control of the confluences of Morava River and other important rivers in the area, i.e. the Olšava, Dlouhá, and Březnice rivers. The site of Napajedla-Maková is located within the Napajedla Gate allowing control of this Gate. The sites Jarošov-Rochuz, Topolná-Bukovina and Osičná allow control of the southern entrance to the Napajedla Gate.

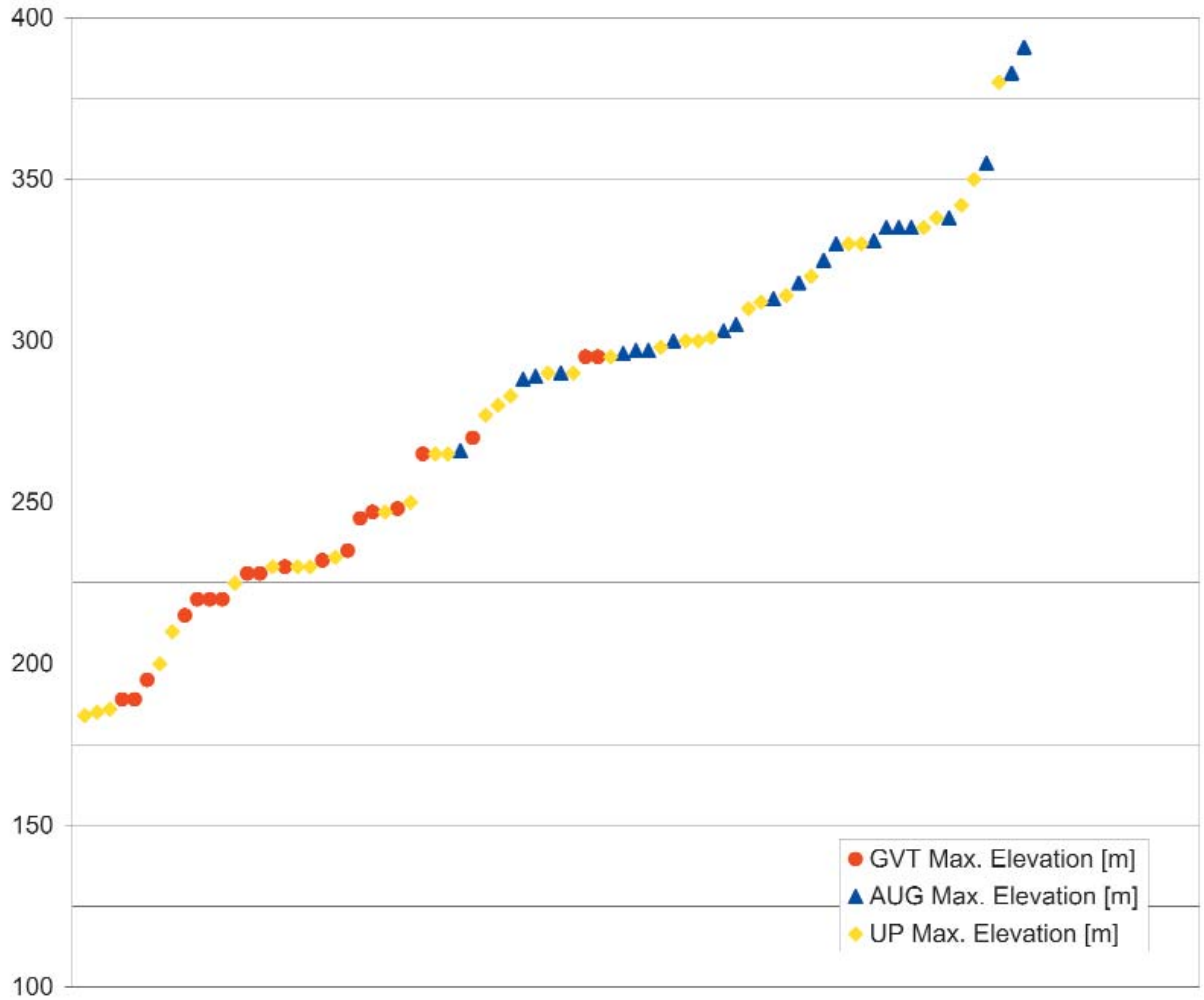
The elevation of the majority of the Aurignacian sites ranges between 290-330 m. Only three sites (Topolná-Osičná, Březolupy-Čertoryje, and Březolupy-Čertoryje "A") are located lower, two sites (Tučapy-Nad horkami, and Buchlovice-Ploskárně) are located slightly higher, and two



Graph 4.5. Distances from the margin of the Morava River valley.

sites (Osvětimany/Žeravice-Hrušková, and Buchlovice-Chrastě) significantly higher. A more detailed inspection reveals that there may be two accumulations of sites may be separated out. The first contains sites just below 300 m, the second at around 325 m. This observation may have been distorted by the small sample size of analyzed sites. However, when elevations of culturally indeterminate sites are added, these two accumulations are more clearly visible.

Other analyzed variables were the proportion of erratic flint among the raw materials and the end scraper/burin ratio among tools. The average ratio of erratic flint is between 60 and 90%; in five cases (Podolí-Strážné, Traplice-Bukáčová and Kopaniny, Tučapy-Nad panským, and Osvětimany/Žeravice) the ratio is extremely low, while in two cases it is almost 100% (Tučapy-Nad horkami and Stříbrnice-Hořístky). The end scraper/burin ratio may be influenced by the small number of artifacts in the individual collections. There are sites where this ratio is 1:1, where burins are prevalent and, sites with endscrapers predominating. Other typological differences are the presence of microlithic implements at Boršice/Buchlovice-Elevation Marker 331 and Kudlovice-Za Hradskou, the presence of nosed endscrapers at Boršice/Buchlovice-Elevation Marker 331, Stříbrnice-Hořístky, and Traplice-Bukáčová, and an increased proportion of carinated endscrapers at Kudlovice-Za Hradskou and Traplice-Bukáčová. Traplice-Bukáčová is also important because of the increased proportion of tools (42%) within the collection. The site dimensions are usually more than 100 m in diameter (the largest site is 600 m), which differs from Gravettian site dimensions. When the possible correlation between variables was analyzed, no correlations were observed.



Graph 4.6. Maximum elevations of Paleolithic sites.

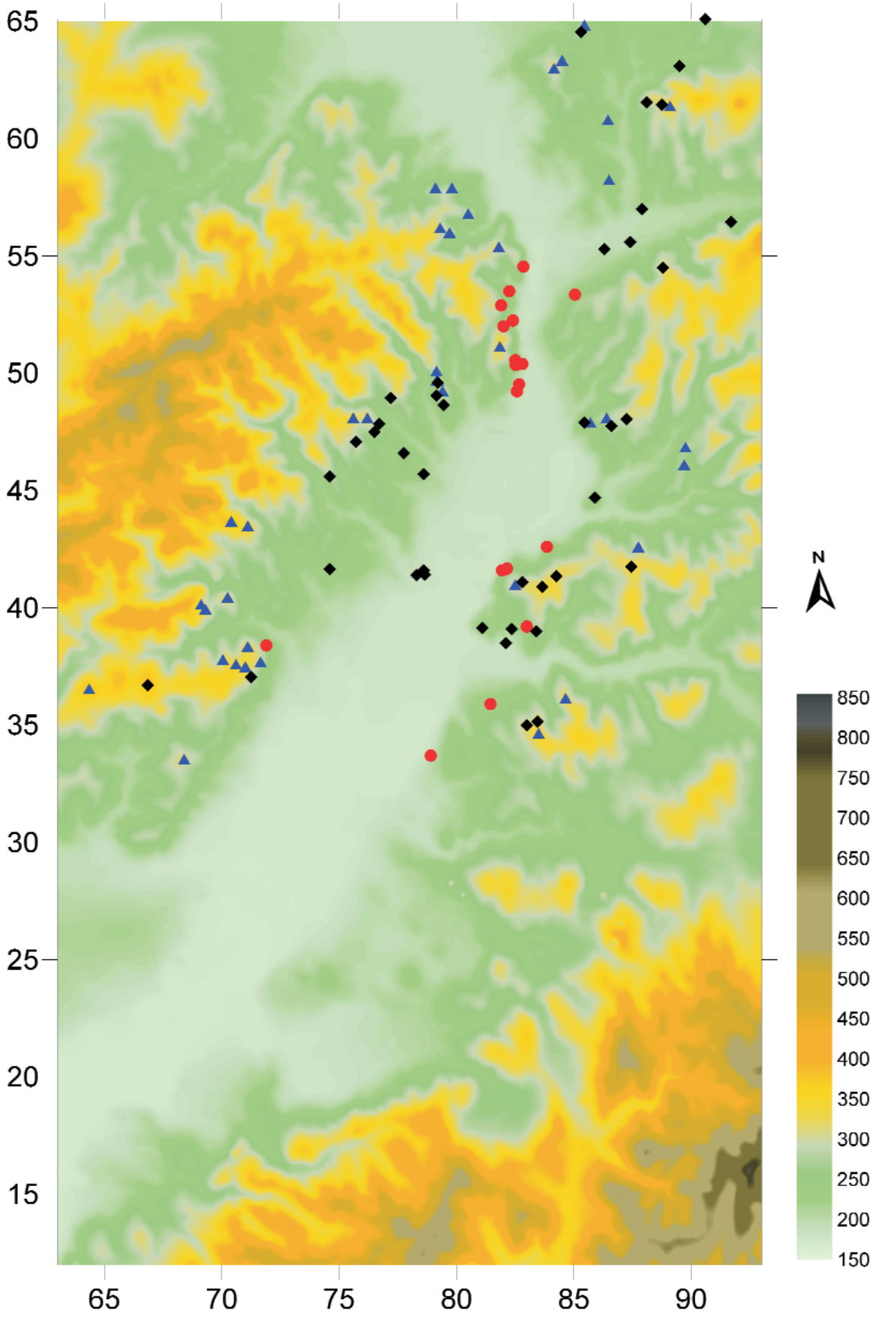


Fig. 4.5. Uherské Hradiště Area. Location of the most important Paleolithic sites. ● – Gravettian sites; ▲ – Aurignacian sites; ◆ – Culturally indeterminate sites.

4.5. A Comparison of Gravettian and Aurignacian Strategies

Based on the results of analysis described in the previous chapters, Gravettian and Aurignacian settlement strategies are compared in following paragraphs. Four main variables were selected for this comparison.

I. A position to the Morava River
Gravettian sites are located close to the Morava River, often on a slope jutting into the Morava River Valley. In contrast, Aurignacian sites are further from the Morava River, often one to five kilometers from the margin of the Morava River valley (measured from the edge of the valley, which has an elevation of 200 m). Here the Gravettian and Aurignacian settlement strategies differ significantly.

II. Position on hill/slope
While Gravettian sites are located on the slopes of hills flanking the Morava River valley, Aurignacian sites are located atop of hills and ridges. In this, Gravettian and Aurignacian settlement strategies differ significantly.

III. A position on or relating to an important feature (landmark) in the landscape and its strategic significance
Gravettian sites are often located on the slopes of major hills (Maková, Černá hora, Tučapy Hill), within sight of the Morava River, their position in the landscape allows control of a section of the Morava River valley, and often the valley gate entrance or the confluence of a smaller stream with the Morava River. In contrast, Aurignacian sites are located atop of significant hills, further from the Morava River and deeper in highlands. Their positions allow control of the surrounding hilly landscape rather than the Morava River valley per se. The sites often overlook Morava River tributaries rather than Morava River itself. Again, Gravettian and Aurignacian settlement strategies differ significantly. This may reflect different hunting strategies and target animals.

IV. Elevation
Gravettian sites are located at elevations between ca. 220 and 290 m. Although several sites are located lower, these were redeposited during landslides. Aurignacian sites are often located at elevations higher than 300 m. In this, the Gravettian and Aurignacian settlement strategies differs significantly.

The differences in the settlement strategies of various Paleolithic cultures were statistically tested in order to create a characteristic vector describing particular settlement strategies. This study allows archaeologists to date small and indeterminate artifacts collections, as well as to predict the discovery of new sites in the future. This can be seen in the Graph 4.6. constructed from the maximum elevations of all Paleolithic sites within the Uherské Hradiště Area. This allows small, indeterminate collections of artifacts to be separated into two categories – probably Aurignacian and probably Gravettian. The level of probability may be assigned using the characteristic vectors. It is highly probable that sites located above the 300 m contour line are Aurignacian sites while sites located below the 250 m contour line are probably Gravettian sites. A problem area is sites located between the 250 and 300 m contour lines. Nevertheless, as elevation increases towards 300 m, the probability that site is Aurignacian rather than Gravettian increases and vice versa.

Afterword

This book summarizes and presents a revised database of archaeological sites and materials collected during the twentieth century (and the first four years of this). However, this database cannot be considered complete. The field survey work continues and this database will be most probably expanded in the future. The database and from characteristic vectors describing settlement strategies that are developed from it, propose how and where to search for new sites.

In 2005 we began a new project that follows on from this now-completed project. In this new project, we would like study in more detail the Gravettian and Epigravettian occupation of the area. We would like to excavate additional sites and obtain new collections of artifacts accompanied by a series of new ^{14}C dates, which will be analyzed in order to develop a typological-chronological framework for Gravettian and Epigravettian occupation within this area.

We will enlarge the previously surveyed area to the north (on the left bank of Morava River between Napajedla and Hulín) and to the south (the right bank of Morava River between Boršice and Bzenec; and a left bank from Ostrožská Nová ves to the Moravian-Slovak border).

We believe that this new project will provide further important results and set new question for future research.

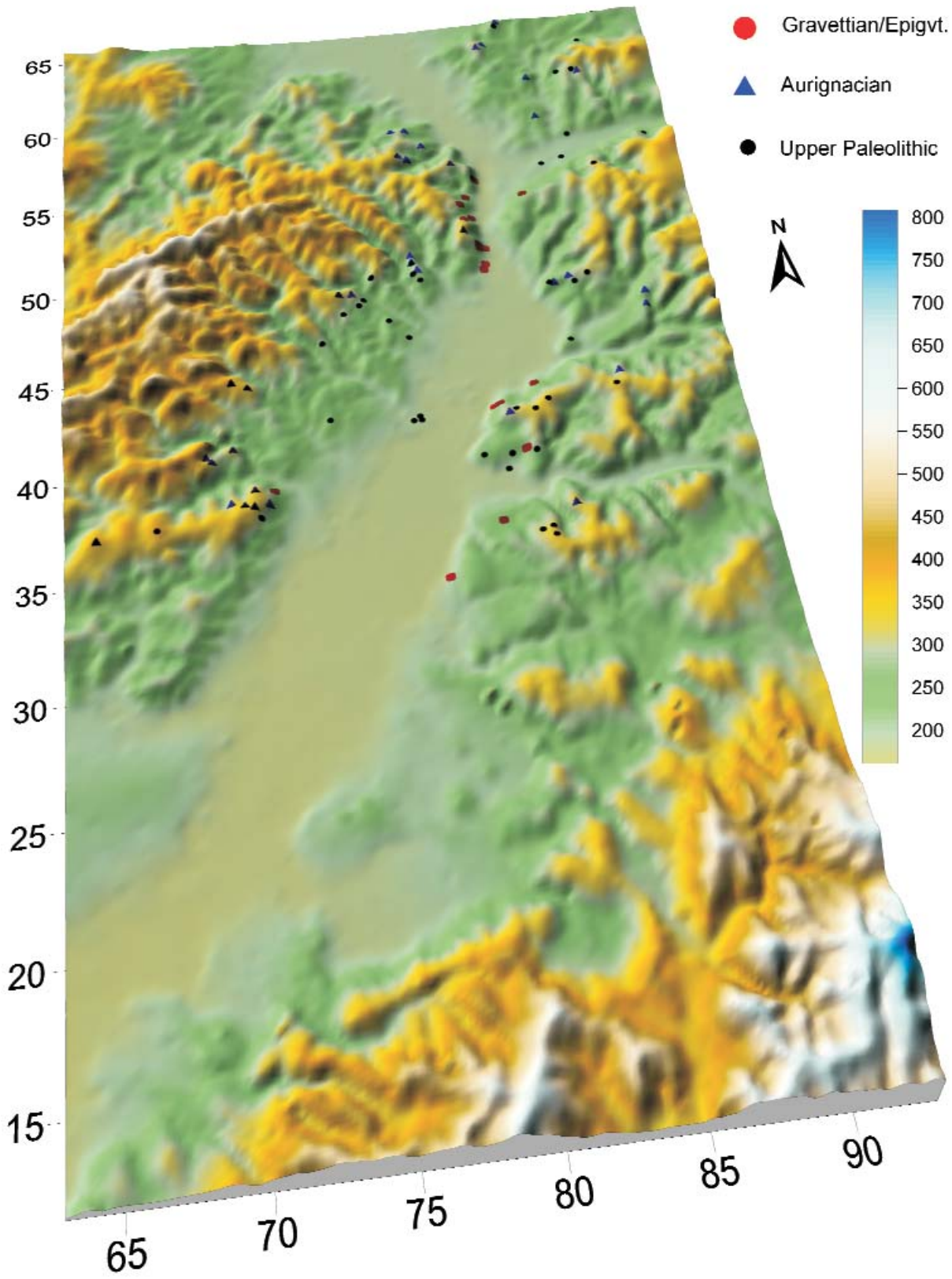


Fig. 4.6. Uherské Hradiště Area, a view from the northeast to the Napajedla Gate. Locations of the most important Paleolithic sites.

Photo 1. A view from Tučapy Hill to the east, i.e. towards the mouth of the Olšava River. On the horizon are the White Carpathians. The arrow indicates Vršatec Hill, a possible radiolarite source.

Photo 2. A view from the Tučapy-Koukolky site to the north; the arrows indicate the Aurignacian sites Boršice/Buchlovice-Elevation Marker 331 (left arrow), and Buchlovice-Chrastě (right arrow).

Photo 3. Surface survey of the Aurignacian site Boršice/Buchlovice-Elevation Marker 331; the arrow indicates another Aurignacian site, Buchlovice-Chrastě.

Photo 4. A view from Jarošov ski slope to the northwest. The arrows indicate the Aurignacian sites of (from left to right) Traplice-Bukáčová, Kudlovice-Za Hradskou, Napajedla-Maková.

Photo 5. A view from the southeast towards the Aurignacian sites of Traplice-Bukáčová (left) and Kopaniny (right).

Photo 6. A view from Bílovice-Štěrky to the Březnice River Valley (to the northeast); the arrow indicates the Aurignacian site Březolupy-Čertoryje.

Photo 7. A view from Rovnina Hill to the south, towards the Olšava River valley. The arrows indicate the sites of (from left to right) Podolí-Strážné, Míkovice-Radovy, and Kunovice-Hluboček.

Photo 8. A view from the Aurignacian find-spot Stříbrnice-Kuče to other Aurignacian sites (from left to right): Tučapy-Nad panským, Nad horkami, and Koukolky.

Photo 9. A view from Bílovice-Štěrky to the north. The arrows indicate the Aurignacian sites of Topolná-Osičná (left) and Bukovina (right).

Photo 10. A view from Jarošov to the northwest. The arrows indicate the Aurignacian sites of (from left to right) Traplice-Bukáčová and Kopaniny, Kudlovice-Hradská and Za Hradskou, and Napajedla-Maková.

Photo 11. The Gravettian sites Jarošov-Podvršťa (left arrow) and Kopaniny (right arrow) from the Morava River (looking towards the south).

Photo 12. The Gravettian site Jarošov-Podvršťa from the village of Jarošov. Note the excavators' tent (arrow).

Photo 13. The Gravettian site of Kněžpole-Hrádek (arrow) from the west.

Photo 14. The Gravettian/Epigravettian site of Mařatice-Kolébky from the Olšava River valley (looking north).

Photo 15. Tučapy Hill from the town of Uherské Hradiště (looking west).

Photo 16. The Gravettian site of Boršice-Chrástka from the southeast.

Photo 17. A view from the Jarošov-Podvršťa excavation (near the tent) towards the Napajedla Gate (to the north).

Photo 18. A view from the Gravettian site of Spytihněv-Duchonce to the Gravettian site of Jarošov-Podvršťa (looking to the south).

Photo 19. A view from an oxbow in the Morava River towards Spytihněv (looking north).

Photo 20. A view from an oxbow of the Morava River to the Spytihněv-Duchonce site (note the excavation tent – arrow).

Photo. 21. Maková Hill from the opposite (east) bank of the Morava River. The arrows indicate the Gravettian sites of (from left to right) Spytihněv-Němeča, Duchonce, and Nad vinohrady.

Photo 22. The Gravettian sites (from left to right) Napajedla II, III and I from the opposite (east) bank of Morava River (looking towards the northwest).

Photo 23. A view from Spytihněv-Duchonce towards the landslide area holding the site of Spytihněv-Nad vinohrady.

Photo 24. Loess exploitation at the Gravettian site Napajedla-Brickyard and the location of southern (bottom left) and northern (bottom right) find-spots. Above the site is Napajedla II. All photos by author.

Bibliography

Absolon, K. 1945: *Die Erforschung der diluvialer Mammutjäger-Station von Unter-Wisternitz in der Pollauer Bergen in Mähren.* Arbeitsbericht über das dritte Grabungsjahr 1926. Brno.

Absolon, K. and Klíma, B. 1977: *Předmostí. Ein Mammutjägerplatz in Mähren.* Fontes Archaeologiae Moraviae 8. Praha: Academia.

Bárta, J. 1980: *Významné paleolitické locality na strednom a západnom Slovensku.* Nitra: AÚ SAV.

Bartošíková, Z. and Přichystal, A. 2003: "Kamenná industrie z gravettské lokality Pavlov I (okr. Břeclav) – jihovýchodní okraj zkoumané plochy." *Archeologické rozhledy* 55, 59-67.

Baščan, M., Bezděčka, P., Jilík, J. and Žižlavský, B. 2003: *Chřiby záhadné a mytické 3*. Uherské Hradiště: Futuro.

Bintliff, J. and Snodgrass, A. 1988: "Off-site pottery distributions: a regional and interregional perspektive." *Current Anthropology* 29, 506-513.

Cílek, V. and Jarošová, L. 2000: "Železité horniny a minerální barviva z paleolitického sídliště v Petřkovicích u Ostravy." *Archeologické rozhledy* 52, 85-100.

Červinka, I.L. 1901: "Kostrový hrob u Kněžpole." *Časopis Vlasteneckého muzejního spolku v Olomouci* 18, 41-44.

Czudek, T., ed. 1972: "Geomorfologické členění ČSR." *Studia Geographica* 23, Brno: GGÚ ČSAV Brno.

Czudek, T. 1994: "Reliéf Moravy a Slezska." In: J. Svoboda et al., *Paleolit Moravy a Slezska*, 11-16. Dolnověstonické studie 1. Brno: AÚ AV ČR Brno.

Czudek, T. 1997: *Reliéf Moravy a Slezska v kvartéru.* Tišnov: Sursum.

Czudek, T. and Ivan, A. 1992: "Reliéf." In: Nekuda, V., ed., *Uherskohradišťsko,* 39-44. Brno: Muzejní a vlastivědná společnost v Brně.

Čtyroký, P. and Stráník, Z. 1995: "Zpráva pracovní skupiny české stratigrafické komise o regionálním dělení Západních Karpat." *Věstník ČGÚ* 70, 3, 67-72.

Demek, J. and Novák, V. et al. 1992: *Neživá příroda.* Vlastivěda Moravská, Země a lid. Brno: Muzejní a vlastivědná společnost v Brně.

Dobosi, V.T. 1994: "Contribution to the Upper Palaeolithic Topography." *Acta Archaeologica Academiae Scientiarum Hungaricae* 46, 3-20.

Galuška, L. 2001: "Pravěké a raně středověké osídlení katastru." In: J. Čoupek, L. Galuška, G. Novotný, M. Novotný, P. Opletal, M. Pavlas, L. Straková and V. Teťhal, *Ostrožská Nová Ves. Z dějin Nové Vsi a Chylic,* 10-62. Ostrožská Nová Ves.

Gojda, M. 2000: *Archeologie krajiny: vývoj archetypů kulturní krajiny.* Praha: Academia.

Havlíček, P. 1980: "Vývoj terasového systému řeky Moravy v hradišťském příkopu." *Anthropozoikum* 13, 93-125.

Horsák, A. 1940: "Výkopy v Kunovicích, Derfli, Míkovicích, Ostrožské Nové Vsi a Hradčovicích." *Sborník Velehradský* 11, 86-94.

Horsák, A. 1941: "Výkopy v Kunovicích, Derfli, Míkovicích, Ostr. Nové Vsi, St. Městě." *Sborník Velehradský* 12, 88-92.

Horsák, A. 1942: "Výkopy v Kunovicích, Derfli, Míkovicích, Polešovicích, Tučapech a v Boršicích u Buchlovic." *Sborník Velehradský* 13, 70-75.

Hromada, J. 1998: "Gravettienske sídliská v Moravanoch nad Váhom a ich miesto vo vývoji mladého paleolitu strednej Európy." *Slovenská archeológia* 46-2, 145-167.

Hrubý, V. 1939: "Nálezy ze Spytihněvi." *Sborník Velehradský* 10, 17-20.

Hrubý, V. 1940a: "Paleolitické sídliště v Boršicích u Buchlovic." *Sborník Velehradský* 11, 21-23.

Hrubý, V. 1940b: "Poznámky". *Sborník Velehradský* 11, 26-27.

Hrubý, V. 1948: *Z pravěku Středního Pomoraví. (Stručný přehled nejstarších dějin a archeologických problémů Uh. Hradišťska).* Uherské Hradiště: Okresní osvětová rada a Slovácké museum v Uh. Hradišti.

Hrubý, V. 1951: "Paleolitické nálezy z Uh.–Hradištska," *Časopis Moravského muzea, Sci. soc.* 36, 65-101.

Hrubý, V. 1982: "Nejstarší dějiny středního Pomoraví." In: V. Nekuda, ed., *Uherskohradišťsko,* 83-167. Brno: Muzejní a vlastivědná společnost v Brně.

Chlachula, J. 1990: "The Early Paleolithic Settlement in the Region of the Middle Course of the River Morava (Czechoslovakia)." *Anthropologie* 28/2-3, 241-248.

Chlachula, J. 1992: "Paläolithische Funde von Petrov in Südostmähren." *Časopis Moravského muzea, Sci. soc.* 77, 59-65.

Inizan, M.L., Reduron-Ballinger, M., Roche, H. and Tixier, J. 1999: *Technology and Terminology of Knapped Stone.* Préhistoire de la Pierre Taillée. Tome 5. Nanterre: CREP.

Ivan, A. and Havlíček, P. 1992: "Geologické poměry." In Nekuda, V., ed., *Uherskohradišťsko,* 9-17. Brno: Muzejní a vlastivědná společnost v Brně.
Kalousek, F. 1955: "Archeologické výzkumy v Boršicích u Buchlovic v roce 1954." *Nové archeologické výzkumy v kraji gottwaldovském v roce 1954,* 35-38. Gottwaldov.
Klíma, B. 1952: "Zjišťovací výzkum výšinných stanic u Napajedel." *Archeologické rozhledy* 4, 385-388.
Klíma, B. 1955a: "Výzkum paleolitického sídliště v Ostravě-Petřkovicích v r. 1953." *Archeologické rozhledy* 7, 141-149.
Klíma, B. 1955b: "Výsledky archeologického výzkumu na tábořišti lovců mamutů v Petřkovicích, okr. Ostrava v roce 1952 a 1953." *Časopis Slezského muzea* 3, 1-35.
Klíma, B. 1956: "Statistická methoda – pomůcka při hodnocení paleolitických kamenných industrií. Návrh české terminologie mladopaleolitických kamenných nástrojů." *Památky archeologické* 47, 193-210.
Klíma, B. 1957a: "Nová paleolitická stanice u Strážnice." *Studie Krajského musea v Gottwaldově, Řada společenských věd* 11, 11-13.
Klíma, B. 1957b: "Příspěvek k rozšíření obsidiánu v paleolitických kamenných industriích." *Študijné zvesti AÚ SAV* 2, 25-27.
Klíma, B. 1963a: *Dolní Věstonice. Výzkum tábořiště lovců mamutů v letech 1947-1952.* Praha: Nakladatelství ČSAV.
Klíma, B. 1963b: "Příspěvek k poznání neolitické štípané kamenné industrie." In: *Sborník 2, Fr. Vildomcovi k pětaosmdesátinám,* 24-25. Brno: AÚ ČSAV Brno.
Klíma, B. 1965a: "Výzkum na paleolitické stanici v Boršicích v r. 1964," *Archeologické rozhledy*, 17, 469-482.
Klíma, B. 1965b: *Boršice.* Nálezová zpráva AÚ AV ČR v Brně, č.j. 411/65.
Klíma, B. 1972: "Nová paleolitická stanice u Stříbrnic." *Časopis Moravského muzea, Sci. soc.* 57, 17-25.
Klíma, B. 1977: "Křišťálová paleolitická industrie z Nové Dědiny." *Anthropozoikum N.S.* 11, 113-133.
Klíma, B. 1978: "Paleolitická stanice u Přestavlk, okr. Přerov." *Archeologické rozhledy* 30, 5-13.
Klíma, B. 1995: *Dolní Věstonice II. Ein Mammutjägerrastplatz und seine Bestattungen.* Dolnověstonické studie 3. Liège.
Klíma, B. 1997: "Zur Frage der Mikroindustrie aus Pavlov." In J. Svoboda, ed., *Pavlov I – Northwest.* 289-312. Dolnověstonické studie 4. Brno: AÚ AV ČR Brno.
Kolbinger, D. 1995: "Pokračování systematického povrchového průzkumu východní části Kroměřížského okresu v roce 1994." *Informační zpravodaj ČAS, pobočka pro sev. Moravu a Slezsko*, 24-35.
Kruťa, T. 1947: "Mineralogický výzkum Slovácka." *Sborník Velehradský* 15, 41-53.
Kříž, M. 1897: "Mamutí ložiska u Mařatic." *Slovácké noviny* XIV, 62, ze dne 7. 8.
Kuna, M. 2000: "Surface artefact studies in the Czech Republic." In: J.L. Bintliff, M. Kuna and N. Venclová eds., *The future of surface artefact survey in Europe,* 29-44. Sheffield Academic Press.
Květ, R. and Kačura, G. 1976: *Minerální vody Jihomoravského kraje.* Praha: ÚÚG.
Lock, G. and Harris, T. 1992: "Visualizing spatial data: the importan ceof Geographic Information Systems." In: P. Reilly, S. Rahtz: *Archaeology and the Information Age,* 81-96. Routledge: London and New York.
Marešová, K. 1985: *Uherské Hradiště-Sady. Staroslovanské sídliště na Dolních Kotvicích.* Uherské Hradiště: ONV Uherské Hradiště.
Mátl, V. 2000: "Révait – netradiční drahý kámen z Ostrožské Nové Vsi." *Minerál* 7/2, 132-138.
Neugebauer-Maresch, C. 1993: *Altsteinzeit im Osten Österreich.* St. Pölten-Wien.
Nigst, P.R. 2004: "Ein Gravettienzeitlicher Behausungsgrundriss? Erste Beobachtungen zur räumlichen Organisation der Fundstelle Grub/Kranawetberg (Österreich)." *Archäologisches Korrespondenzblatt* 34, 153-168.
Oliva, M. 1979: "Nové paleolitické lokality Milovice a Lhotka, okres Kroměříž." *Studie Muzea Kroměřížska* '79, 36-42.
Oliva, M. 1981: "Acheulian finds from Karolín, District of Kroměříž (Czechoslovakia)." *Anthropologie N. S.* 19, 27-32.
Oliva, M. 1987: *Aurignacien na Moravě.* Studie Muzea Kroměřížska '87, 5-128.
Oliva, M. 1998a: "Gravettien východní Moravy." *Acta Mus. Moraviae, Sci. soc.,* 83, 3-65.
Oliva, M 1998b: "K ekonomii surovin štípané industrie moravského gravettienu." *SPFFBU* M3, 9-32.
Oliva, M. 1999: "L'industrie Lithique du secteur G à Milovice (Moravie du sud) et le faciès „méridional" du Gravettien morave." In: D. Sacchi, ed., *Les faciès leptolithiques du nord-ouest méditerranéen: milieux naturels et culturels.* XXIV^{e} Congrès Préhistorique de France, Carcassonne 26-30 septembre 1994, Paris, SPF, 139-150.
Oliva, M. 2000: "Gravettienská sídliště u Dolních Věstonic." *Acta Mus. Moraviae, Sci. soc.* 85, 29-108.
Oliva, M. 2002: "Využívání krajiny a zdrojů kamenných surovin v mladém paleolitu českých zemí." *Archeologické rozhledy* 54, 555-581.

Procházka, R. 1983: "Záchranný výzkum paleolitické stanice v Uherském Hradišti-Jarošově, okr. Uherské Hradiště." *Archeologické rozhledy* 35, 552-554.
Přichystal, A. 1994: "Zdroje kamenných surovin." In: J. Svoboda a kol. *Paleolit Moravy a Slezska.* Dolnověstonické studie 1. Brno: AÚ AV ČR Brno.
Přichystal, A. 2002: "Zdroje kamenných surovin." In J. Svoboda et al. *Paleolit Moravy a Slezska.* 2. aktualizované vydání. 67-76. Dolnověstonické studie 8. 43-49. Brno: AÚ AV ČR Brno.
Seitl, L. and Valoch, K. 1998: "Stanice gravettienských lovců mamutů v Jarošově." *Acta Mus. Moraviae, Sci. soc.* 83, 67-81.
Skutil, J. 1928: "Les trouvailles d'obsidienne et d'ambre dans les stations paléolithiques." *L' Homme préhistorique* 15, 100-105.
Skutil, J. 1936: "Übersicht der mährischen Paläolitischen Funde." *Swiatowit* 16, 47-78.
Skutil, J. 1940: "Paleolitické nálezy z Hradištska a přilehlého Pomoraví." *Sborník Velehradský* 11, 50-69.
Skutil, J. 1941: "Nové doklady paleolitického osídlení z Uhersko-Hradištska." *Sborník Velehradský* 12, 99-100.
Skutil, J. 1965: *Bibliografie moravského pleistocénu 1850-1950.* Brno.
Soffer, O. 1991: *Archaeological dictionary of stone tools.* Moscow: Institute of Archaeology AN SSSR.
Stadler, P., Draxler, S., Friesinger, H., Kutschera, W., Priller. A., Rom, W., Steier, P. and Wild, E. 2000: Status of the Austrian Science Funds Project P12353-PHY: *Absolute Chronology for Early Civilisations in Austria and Central Europe using ^{14}C dating with Accelerator Mass Spectrometry.* Manuscript, Wien.
Svoboda, J. 1994a: "Spatial distribution and typology." In: J. Svoboda, ed., *Pavlov I. Excavations 1952-1953.* ERAUL 66/Dolnověstonické studie 2, 47-57. Liège.
Svoboda, J. 1994b: "Afterword." In: J.Svoboda, ed., *Pavlov I. Excavations 1952-1953.* ERAUL 66/Dolnověstonické studie 2, 211-225. Liège.
Svoboda, J. 1994c: "The Upper Palaeolithic settlement of the Vyškov Gate: Regional survey, 1988-1992." *Památky archeologické* 85-2, 18-34.
Svoboda, J. 1995a: "Palaeolithic landscapes of Moravia: A mosaic of occupation strategies." *Geolines* 2, 7-9.
Svoboda, J. 1995b: "Wedge-shaped microblade cores from Moravia and Silesia." *Archeologické rozhledy* 47, 651-656.
Svoboda, J. 1997: "Lithic industries of the 1957 area." In: J. Svoboda, ed., *Pavlov I – Northwest.* 179-209. Dolnověstonické studie 4. Brno: AÚ AV ČR Brno.
Svoboda, J. 1999: "Boršice (okr. Uherské Hradiště)." *Přehled výzkumů* 40 (1997-1998), 147.
Svoboda, J. a kol. 1994: *Paleolit Moravy a Slezska.* Dolnověstonické studie 1. Brno. Brno: AÚ AV ČR Brno.
Svoboda, J. a kol. 2002: *Paleolit Moravy a Slezska.* 2. aktualizované vydání. Dolnověstonické studie 8. Brno. Brno: AÚ AV ČR Brno.
Svoboda, J., ed. 1991: *Dolní Věstonice II – western slope.* ERAUL 54. Liège.
Svoboda, J., ed. 1994: *Pavlov I. Excavations 1952-1953.* ERAUL 66/Dolnověstonické studie 2. Liège.
Svoboda, J., ed. 1997: *Pavlov I – Northwest*. Dolnověstonické studie 4. Brno: AÚ AV ČR Brno.
Svoboda, J., Klíma, B., Jarošová, L., Sládek, V. and Škrdla, P. 1999: "K analýze velkých loveckých sídlišť: Projekt výzkumu gravettienu v letech 1995-1997." *Archeologické rozhledy* 51, 9-25.
Svoboda, J., Klíma, B., Jarošová, L. and Škrdla, P. 2000: "The Gravettian in Moravia: climate, behaviour and technological complexity." In: W. Roebroeks, M. Mussi, J. Svoboda, K. Fennema, eds. *Hunters of the Golden Age,* 197-217. University of Leiden.
Svoboda, J., Klíma, B., Škrdla, P. 1995: "The Gravettian Project: Activities during the 1991-1994 Period." *Archeologické rozhledy*, 47, 279-300.
Svoboda, J., Ložek, V. and Vlček, E. 1996: *Hunters between east and west: The Paleolithic of Moravia.* New York: Plenum Press.
Svoboda, J., Škrdla, P., and Jarošová, L. 1993: "Analyse einer Siedlungsfläche von Dolní Věstonice." *Archäologisches Korrespondenzblatt* 23, 393-404.
Šimana, M. 1971: "Geodesie v archeologické praxi." *Zprávy Čs. spol. arch. při Čs. akademü věd, Supplement* 9. Praha.
Šimana, M. and Vencl, S. 1970: "Návrh na jednotné polohové určování archeologických nalezišť." *Archeologické rozhledy* 22, 574-585.
Škrdla, P. 1997: "The Pavlovian lithic technologies." In: J. Svoboda, ed., *Pavlov I – Northwest.* 313-372, Dolnověstonické studie 4. Brno: AÚ AV ČR Brno.
Škrdla, P. 1999: "Uherské Hradiště-Jarošov (okr. Uherské Hradiště)." *Přehled výzkumů* 40 (1997-1998), 179-183.
Škrdla, P. 2000: "Předběžná zpráva o výzkumu tábořišť pavlovienu na Uherskohradišťsku." *Slovácko* 42, 91-101.
Škrdla, P. 2001a: "Uherské Hradiště (k. ú. Jarošov u Uherského Hradiště, okr. Uherské Hradiště)." *Přehled výzkumů* 42, 122-126.

Škrdla, P. 2001b: "Skládanky z Dolních Věstonic II (západní svah)." *Památky archeologické* 92, 153-157.
Škrdla, P. 2002: "Uherské Hradiště (k. ú. Jarošov u Uh. Hradiště, okr. Uherské Hradiště)." *Přehled výzkumů* 43, 147-149.
Škrdla, P. 2003: "The Gravettian occupation of the Uherské Hradiště Area." In: J.A. Svoboda and L. Sedláčková, eds., *The Gravettian along the Danube.* Proceedings of the Mikulov conference, 20.-21. November 2002. 153-163. Dolnověstonické studie 11. Brno: AÚ AV ČR Brno.
Škrdla, P. 2004: "Uherské Hradiště (k. ú. Jarošov u Uh. Hradiště, okr. Uh. Hradiště)." *Přehled výzkumů* 45, 116-117.
Škrdla, P., Cílek, V. and Přichystal, A. 1996: "Dolní Věstonice III, excavations 1993-1995." In: J. Svoboda, ed., *Paleolithic in the Middle Danube region.* 173-190. Brno: Spisy AÚ AV ČR Brno 5.
Škrdla, P. and Kruml, O. 2000: "Uherské Hradiště (k. ú. Jarošov u Uh. Hradiště, okr. Uh. Hradiště)." *Přehled výzkumů* 41 (1999), 88-92.
Škrdla, P. and Lukáš, M. 2000: "Příspěvek k otázce geografické pozice lokalit pavlovienu na Moravě." *Přehled výzkumů* 41 (1999), 21-33.
Škrdla, P., Mateiciucová, I. and Přichystal, A. 1997: "Mesolithikum (gespaltene Steinindustrie)." In: L. Poláček, ed., *Studien zum Burgwall von Mikulčice* 2, 45-91. Brno: AÚ AV ČR Brno 7.
Škrdla, P. and Musil, R. 1999: "Jarošov II – nová stanice gravettienu na Uherskohradišťsku." *Přehled výzkumů* 39 (1995-1996), 47-62.
Škrdla, P. and Nývltová Fišáková, M. 2003: "Spytihněv – „Duchonce": nová malá stanice gravettienu v Napajedelské bráně." *Slovácko* 45, 89-94.
Škrdla, P., Nývltová Fišáková, M., Novák, M. and Nývlt, D. 2005. "Spytihněv (okr. Zlín)." *Přehled výzkumů* 46, 207-211.
Škrdla, P., Nývltová Fišáková M. and Nývlt, D. 2005. "Napajedla (okr. Zlín)." *Přehled výzkumů* 46, 198-201.
Škrdla, P. and Přichystal, A. 2003: "Boršice u Buchlovic (okr. Uh. Hradiště)." *Přehled výzkumů* 44, 177-187.
Škrdla, P. and Svoboda, J. 1998: "Sídelní strategie v paleolitu: mikroregionální studie." In: P. Kouřil, R. Nekuda, J. Unger, eds., *Ve službách archeologie.* 293-300. Brno: Spisy AÚ AV ČR Brno 10.
Škrdla, P., Šebela, L. and Přichystal, A. 2003: "Boršice u Buchlovic (okr. Uherské Hradiště)." *Přehled výzkumů* 44, 217.
van der Plicht, J. 1997: "The radiocarbon dating." In: J.Svoboda, ed., *Pavlov I – Northwest.* 427-436. Dolnověstonické studie 4. Brno: AÚ AV ČR Brno.
Valoch, K. 1979: "Paleolit středního Pomoraví." *Studie Muzea Kroměřížska* '79, 22-35.
Valoch, K. 1985: "Paleolitická stanice v Hostějově (o. Uh. Hradiště)." *Časopis Moravského muzea, Sci. soc.* 70, 5-16.
Valoch, K. 1986: "Příspěvek k poznání zdrojů surovin v mladém paleolitu na Moravě." *Časopis Moravského muzea, Sci. soc.* 71, 5-18.
Valoch, K. 2004: "Příspěvek k otázce bifasů v paleolitu východní Moravy." *Archeologické rozhledy* 56, 343-347.
Vandiver, P. 1997: "Pavlov I pigments and their processing." In: J. Svoboda, ed., *Pavlov I – Northwest.* 373-381. Dolnověstonické studie 4. Brno: AÚ AV ČR Brno.
Verpoorte, A. 1997: "Along the peripheries of a radiolarite concentration: the lithic industry of 1956/abc and 1958." In: J. Svoboda, ed., *Pavlov I – Northwest.* 211-226. Dolnověstonické studie 4. Brno: AÚ AV ČR Brno.
Vokáč, M. and Vokáč, J. 2001: "Další archeologické nálezy z okolí Kroměříže." *Archeologie Moravy a Slezska* 1, 159-164.
Zapletal, K. 1945: "Mineralogische Beschaffenheit der Unter-Wisternitzer Steinartefakte." In: K. Absolon, *Die Erforschung der diluvialer Mammutjäger-Station von Unter-Wisternitz in der Pollauer Bergen in Mähren.* Arbeitsbericht über das dritte Grabungsjahr 1926, 219-221. Brno.
Zelnitius, A. 1933: "Stručný přehled archeologie a archeologického výzkumu v okresu Uhersko-Hradišťském." *Sborník Velehradský* 4, 12-18.
Zelnitius, A. 1936: "Výzkum Starého Města. Příspěvek k luštění otázky velkomoravského Velehradu." *Sborník Velehradský* 7, 4-7.
Zelnitius, A. 1937: "Velehrad – pravdou." *Sborník Velehradský* 8, 18-31.
Zelnitius, A. 1938: "Nálezy palaeolithu na Velehradě." *Sborník Velehradský* 9, 16-18.
Zemek, M. 1992: "Místopis jednotlivých obcí." In: Nekuda, V., ed., *Uherskohradišťsko,* 427-825. Brno: Muzejní a vlastivědná společnost v Brně.
Žižlavský, B. 1999: "Nové paleolitické lokality v k. ú. Buchlovice." *Informační zpravodaj ČAS, pobočka pro sev. Moravu a Slezsko* 1999, 14-17.