Places of art, traces of fire. A contextual approach to anthropomorphic figurines in the Pavlovian

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2 The Pavlovian — stratigraphy, environment, settlement

2.1 Introduction

Before engaging in more detail about the anthropomorphic figurines, it is necessary to describe the Pavlovian in general terms. In this chapter I provide an outline of the geography of Central Europe and of the stratigraphic frameworks in which the Pavlovian can be situated. It aims at giving a chronological position to the Pavlovian within the Pleistocene history of Central Europe. These outlines form the background for an introduction to the Pavlovian in more specific archaeological terms. After defining the Pavlovian, the extent of the Pavlovian living space is explored by looking at the distribution of sites and raw materials. Several aspects of Pavlovian settlement, in contrast to earlier and later Upper Palaeolithic periods, are also noted.

2.2 A geography of Central Europe

2.2.1 OF MOUNTAINS AND BASINS

Mountain chains, highlands, basins and a network of river valleys characterize the Central European landscape (figure 2.1). It is frequently characterized as a system of passages and

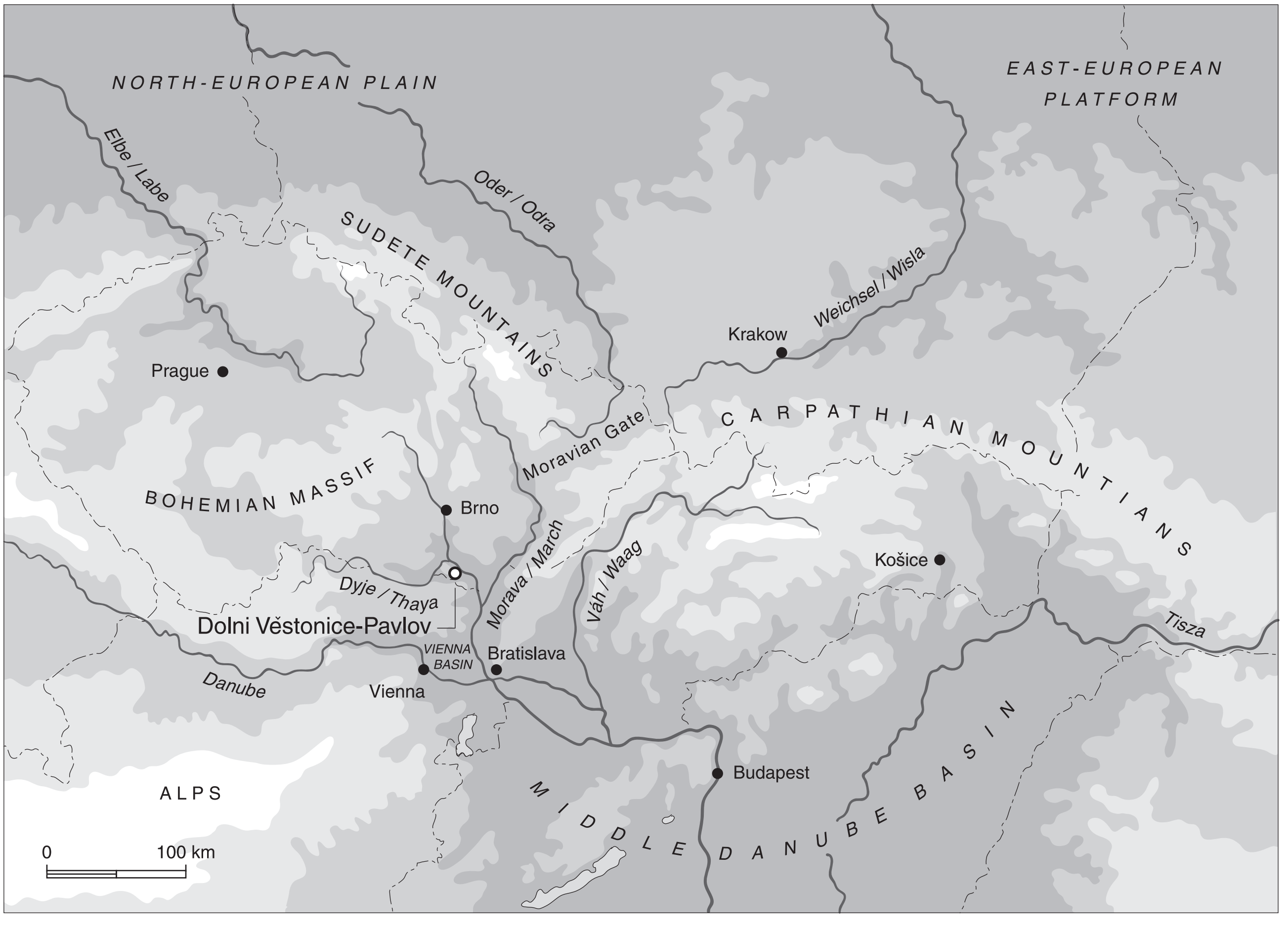

Fig. 2.1 General physical geography of Central Europe.

corridors, connecting east and west and north and south (Svoboda, Ložek, Vlček 1996). The main features of Central Europe are described here in order to provide a background to the quaternary geology of the region as well as its palaeolithic settlement. The Central European landscape is dominated by large mountain chains that cross the region. The Austrian Alps with their foreland are located in the south-west. They continue to the north-east in the Carpathian mountain arc with its highest summit in the High Tatras. The two mountain ranges are separated by the Danube and Morava rivers and the Vienna basin. This lowland continues south-eastwards into the Carpathian or Middle Danube Basin. The Bohemian-Moravian highlands (Bohemian Massif) forms the north-western boundary. The Oder and Weichsel river valleys connect the region with the North European Plain and the East European Platform. The main European watershed also runs across the region. The Morava and its tributaries drain via the Danube into the Black Sea, the Oder and Weichsel rivers drain into the Baltic.

The geography is the result of a complex geological history, in which mountain-building is one of the most important processes. Central Europe is located on the boundary between two large tectonic units. The Bohemian-Moravian highlands belong to the Meso-European tectonic unit and were formed during the Hercynian orogenesis some 300 million years ago. The Alps and Carpathian mountains were formed during the Alpine orogenesis, culminating in the Mid-Tertiary (ca. 16 million years ago), resulting from the collision of the African and Eurasian continental plates. The Alpine upheaval is accompanied by subsidence in other areas. The Alpine and Carpathian foredeep runs along the northern edge of the Alpine and Carpathian mountain chain. The foredeep is bounded by the Bohemian Massif in the north-west and the limestone plateau of southern Poland. The Alpine and Carpathian mountain ranges are separated by the subsidence basin of Vienna. The Middle Danube Basin is surrounded by the Carpathian arc. These subsidence basins form the basis for the drainage basins of the Danube, Morava and Váh rivers and their tributaries.

The pre-Quaternary geological history of mountain-building resulted in different sedimentary environments. Quaternary sediments accumulated in the subsidence basins and downstream ranges of the river valleys. In these areas, long sequences of Quaternary sediments were formed which document the regional and global climatic circumstances. In the mountainous areas, plateaus and upstream river valleys, erosion and weathering processes dominate. They result in rock waste, residual deposits and slope degradation.

2.2.2 CLIMATIC CONSEQUENCES

The geographical situation has a profound palaeoclimatic significance. On a European scale, the region 'is located close enough to the Atlantic Ocean to show its influence of atlantic-type climates during interglacials, but at the same time it is far enough inland to develop continental chernozem steppes during interstadials' (Kukla 1975, 101). In addition to the east-west gradient in climatic circumstances, the north-south gradient is important in this mid-latitude region. The Alps and Carpathians form a climatic barrier between the northern influence of the Fennoscandinavian ice-sheet and the more southern influences in the Middle Danube Basin. Under glacial circumstances, the Middle Danube Basin provides a refuge for more demanding vegetation. The relief itself creates a third gradient. The mountains and their forelands are influenced by the waxing and waning of the Alpine ice-sheet. The Carpathian glaciers are generally rather small and local. The lower parts of the region have never been glaciated, but are influenced by a continental periglacial climate with the extension of the ice-sheets. The geographic variation in Central Europe in short creates considerable climatic variation along the longitudinal, latitudinal and altitudinal gradients. These three gradients increase under glacial circumstances (cf. Zagwijn 1989).

2.3 Outline of a stratigraphic framework

The period of the Late Pleistocene that is at stake here is the transition from moderate to full glacial conditions. It corresponds to the last part of Marine Isotope Stage 3 and the beginning of Marine Isotope Stage 2. The boundary between these stages is set at 24 kyr BP (in calendar years, after Martinsson et al. 1987). The reference to the global standard of Marine Isotope Stages is useful here, because Central European stratigraphic terminology is far from uniform. The five countries in Central Europe all have their own systems. Moreover, the region is located in-between the two main European stratigraphic systems. Referring to the Alpine sequence, the period under consideration is the transition from Middle to Upper Würm. With reference to the Fennoscandinavian sequence, the period is known as the second half of the Middle Weichselian or Pleniglacial.

In the period at stake the region is described as part of the periglacial domain (Demek and Kukla 1969). This means that conditions, processes and land forms are associated with cold, non-glacial environments. Intense frost action is dominant and permafrost-related features are often present though not diagnostic for the periglacial domain. At mid-latitudes, the daily rhythm of freeze-thaw cycles was probably more important for the intensity of frost action than the seasonal differences. Though not specific for the periglacial domain, mass wasting processes reach their greatest intensity here. Of particular importance are solifluction, soil creep and slopewash processes. A third process is intense wind action, both

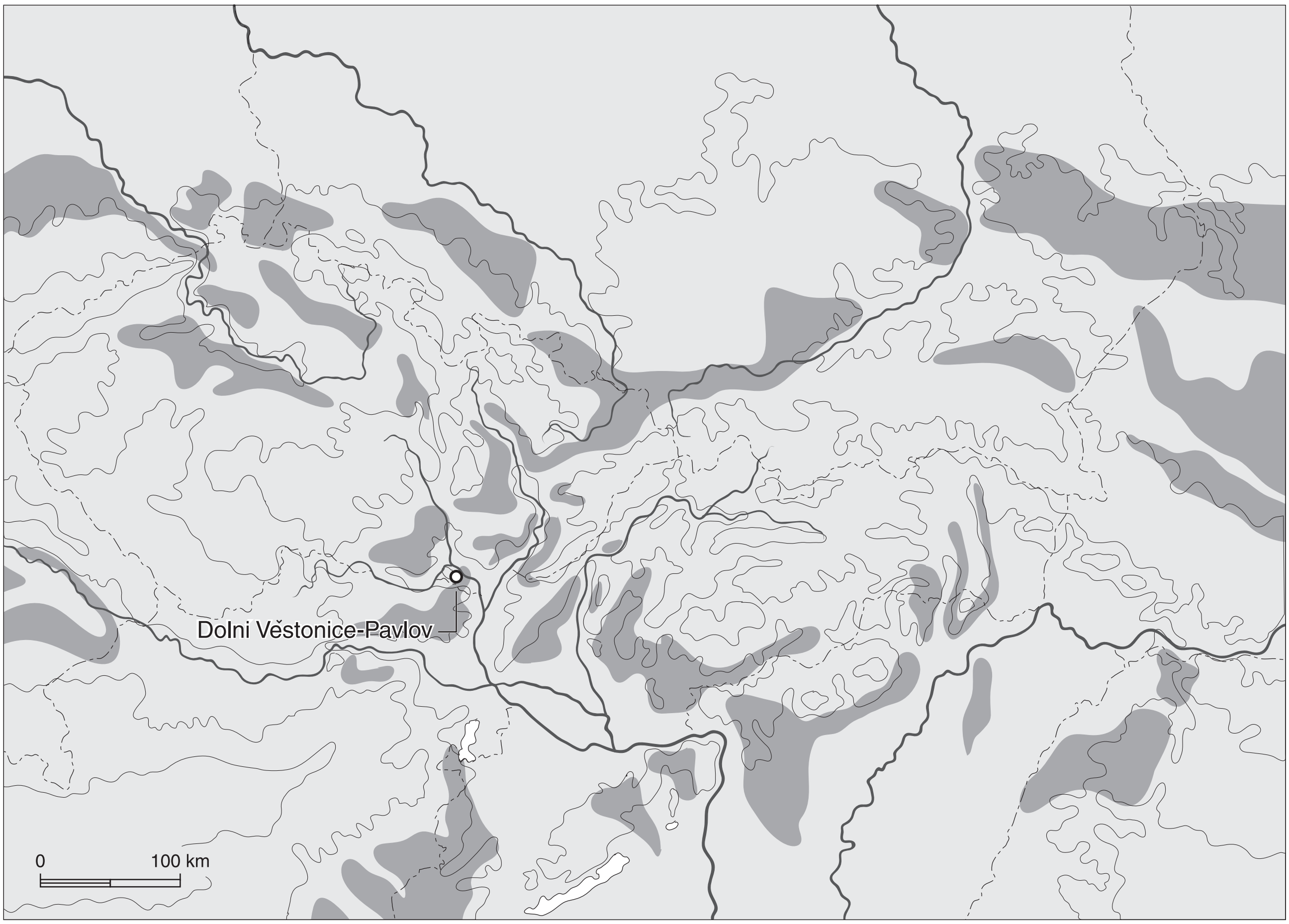

Fig. 2.2 Generalized distribution of loess and loess-derived deposits (dark areas).

erosive, transportive and depositional (loess). Its heightened importance is due to the atmospheric conditions resulting from the large ice-sheets.

Loess and its derivatives form the most common Pleistocene sediments in Central Europe (figure 2.2). It is a fine-grained, wind-blown sediment, which forms thick covers. Loess is often redeposited by slope processes as is evident in rhythmic bedding and fine lamination. The source material results from glacial weathering conditions and meagre vegetation cover in ice-marginal outwash plains. Soil development is quite marked and the sometimes high sedimentation rate may preserve and separate different palaeosols in seemingly continuous sequences. Other aspects however are easily overlooked: loess is vulnerable to erosion and redeposition before consolidation and these events and processes are often very difficult to recognize, even in thin section for micromorphology.

An important loess section for the Late Pleistocene is located in the former brickyard at Dolní Věstonice (South Moravia, Czech Republic), in the immediate vicinity of the palaeolithic settlements that are central to this study. It is one of the key sections in Central Europe for the period at stake. I shall therefore first describe the relevant part of this section in some detail and then compare it with several other sections across the region.

2.3.1 The Dolní Věstonice brickyard

The former brickyard is located on the south bank of the Dyje (Thaya) river, just outside the village of Dolní Věstonice (figure 2.3). The brickyard is cut in the lower parts of the northern slope of the Pavlov Hills. These hills are part of a series of Jurassic and Upper Cretaceous limestone outcrops stretching from Lower Austria through Moravia (Brno-Stránská skála, Předmostí) into Silesia and Poland (figure 2.4). The limestone rocks are surrounded by much younger Tertiary sediments of the Flysch- or Waschberg zone.

The slopes of the Pavlov Hills are covered by loess and its derivatives, in which Jurassic limestone debris and Tertiary

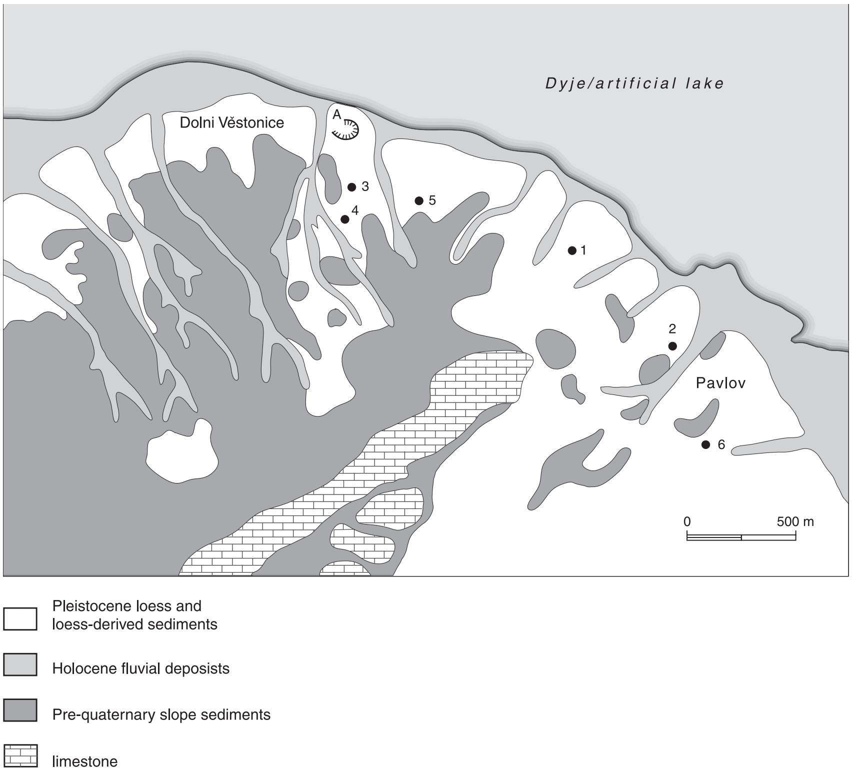

Fig. 2.3 Location of the Dolní Věstonice brickyard (A) in the local geology.
Sites: 1. Dolní Věstonice I; 2. Pavlov I; 3. Dolní Věstonice II; 4. Dolní Věstonice II-A; 5. Dolní Věstonice III; 6. Pavlov II.

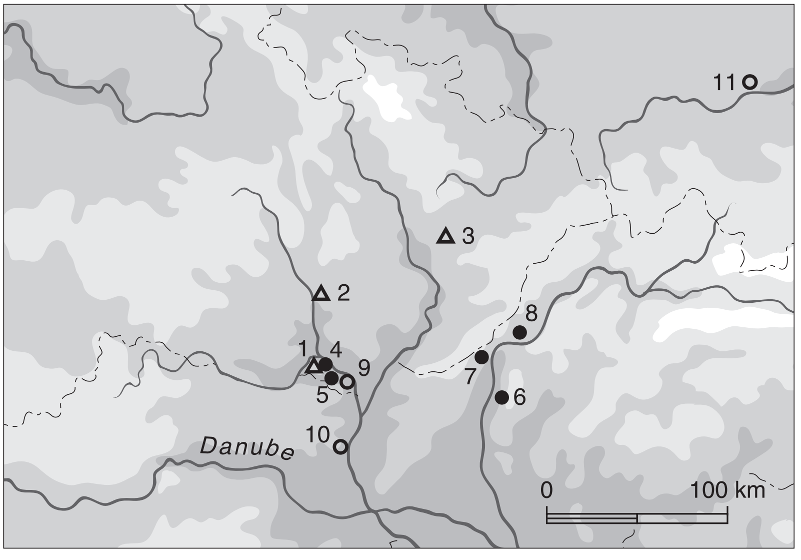

Fig. 2.4 Geological locations mentioned in the text.
Δ Limestone outcrops: 1. Pavlov Hills; 2. Stránská skála; 3. Předmostí.
● Loess-sections: 4. Dolní Věstonice; 5. Milovice; 6. Moravany-Žakovská; 7. Nové Mesto-Mněsice; 8. Zamarovce.
○ Pollencurves: 9. Bulhary; 10. Stillfried; 11. Nowa Huta.

clays and sands are frequent. The loess sequence exposed in the brickyard accumulated at the foot of these slopes (figure 2.5). It reaches a thickness of over 20 meters in the east profile.
The sequence of loesses and palaeosols represents the last interglacial/glacial cycle B (cf. Demek and Kukla 1969). Remnants of earlier cycles have been demonstrated in corings (Frechen et al. 1999) and in some upslope exposures (Klíma 1995). The base of the main brickyard section is formed by a truncated Bt horizon of a forest soil (*Parabraunerde*). On top of it, there are three dark brown horizons, interpreted as steppe soils (chernozems), separated by loess, loessic material and pellet sands. Further upslope these soil horizons can no longer be distinguished and they may form one soil complex (figure 2.6).
These pedocomplexes (PK III and II[1]) are covered by about twelve metres of loess and its derivatives, accumulated in a depression. This loess sequence is divided by a laminated, weak brownish sandy silt loam, containing charcoal particles. It can be interpreted as a reworked cambisol, designated as pedocomplex I (PK I), characterized by decalcification, brownification and formation of new clay minerals, due to limited biological activity in the topsoil. This horizon forms a gentle slope, different from the underlying pedocomplexes. Traces of Pavlovian occupation occur just above this soil sediment. The five metres of loess above the soil contain four horizons with traces of initial pseudogleyification[2]. Strictly speaking, the term ‘loess’ is not applicable here, because the sediments in the sequence are not deposited by aeolian processes, but re-deposited by slopewash processes forming fine laminated silt loams. In the top of the loess sequence, a Holocene soil is formed.
The relevant part here concerns the upper soil sediments (PK I) and the loess above. This sequence is dated by means of the radiocarbon method (Klíma et al. 1961) as well as TL- and IRSL-techniques (Frechen et al. 1999). Two C14-dates for the top of the PK I sediments date to 28,300 ± 300 yrs BP (GrN-2092) and 29,000 ± 200 yrs BP (GrN-2598). These dates indicate more or less the end of soil formation. Two other C14-dates are available for the loesses above PK I: 18,400 ± 700 yrs BP (GrN-2093) and 15,350 ± 1,000 yrs BP (GrN-2102[3]). These dates are confirmed by dating of loess by TL- and IRSL-techniques. They indicate that most loesses were deposited between 15 and 20 kyr BP and that the sediments immediately above PK I were deposited after about 25 kyr BP At several locations in the Pavlov Hills, intense frost-related features have been observed in these upper loesses, in particular in relation with the upper gleysols. They include frost cracks and a clastic diapir[4] (Klíma 1963a, 62). These features indicate that the main loess deposition is related to the maximum cold stage of the last glacial cycle.

2.3.2 REGIONAL COMPARISONS

Klíma et al. (1961) propose to refer to the soil horizon and its redeposited sediments (PK I) as the Dolní Věstonice soil complex. Equivalents are widespread in Central Europe[5]. They are referred to as PK I in Slovakia, the Stillfried-B soil horizon in Lower Austria, the Mende Upper soil horizon in Hungary and the Lohne soil in Southern Germany. It is also frequently designated as Würm 2/3. These names designate a variety of soil types. The most common is the cambisol. Other documented types are for example a weakly developed pseudogley in Milovice (Smolíková 1991) and an intermediate type between a chernozem and a pararendzina in Stránská skála (Svoboda 1991a) (figure 2.4). The lateral changes in soil type can be attributed to differences in climate, relief, parent material, organic life and duration of soil formation (Catt 1991).
The end of the soil formation period is best dated by the sediments just above. Depending on the local situation, the soil formation finished between 28 and 25 kyr BP. The start of the soil formation is more difficult to establish. The soil development is usually correlated with the Würm 2/3 interstadial of the Alpine sequence or the Denekamp Interstadial of the Northern European stratigraphy. This means a date of about 32 kyr BP for the beginning of soil formation. According to Ložek (Svoboda, Ložek, Vlček 1996, 31), a start in the preceding Hengelo Interstadial cannot always be excluded.
In the sequence on top of this soil, a number of gleysols or redeposited remnants have been identified. Gleyification is caused by stagnated water above an impenetrable stratum, for example a frozen subsoil or clay sediments. The stratigraphic correlation of these gley soils is very difficult as local hydrological circumstances are of prime importance. Gleysols are also documented in South Poland (Kozlowski 1990). In a generally similar stratigraphic position, two humiferous horizons are described from the more southern Hungarian Basin (Pecsi and Hahn 1969, Wintle and Packman 1988).
In terms of lithology, the Dolní Věstonice series, the loess sequence above PK I, consists entirely of silt loams redeposited by slopewash processes. In many other sections, the upper loess is divided in two units. At Předmostí, a lower unit of loess interstratified by redeposited sediments, including the Gravettian cultural layer, is distinguished from an upper unit of pure loess, containing one or more gley horizons (Svoboda et al. 1994). Other sections with two such units are for example Zamarovce (Prošek and Ložek 1954), Nové Mesto-Mnešice (Kukla et al. 1961) and Moravany-Žakovska (Hromada and Kozłowski 1995) in Slovakia (figure 2.4). Similar distinctions are made in Poland (Mojski 1969, Kozlowski 1990) and Hungary (Pecsi and Hahn 1969). For Central Europe in general Haesaerts has made a distinction

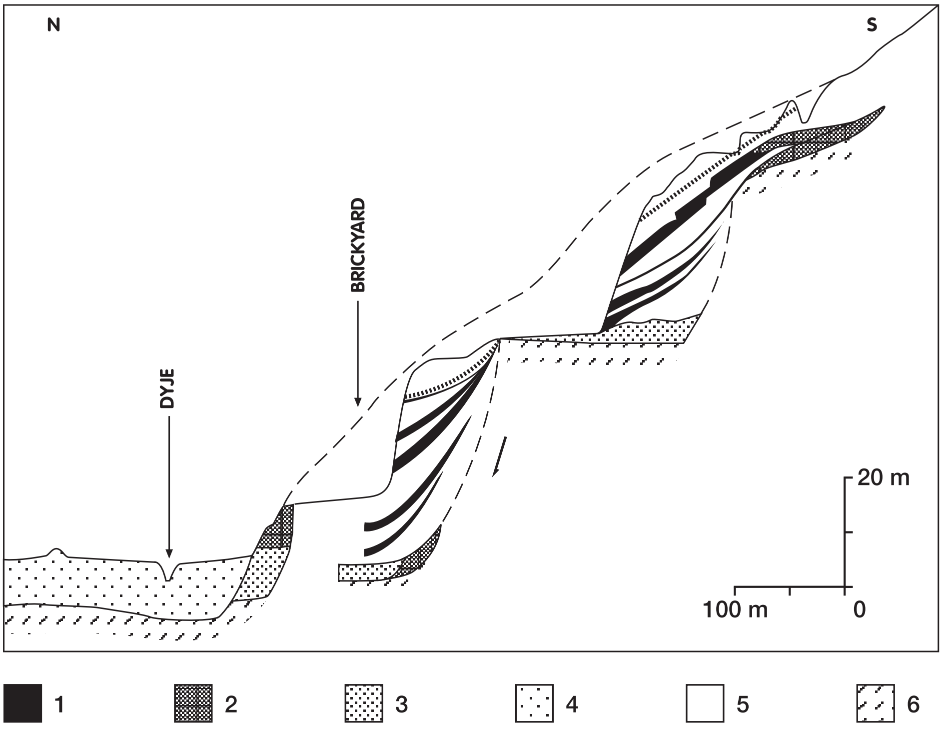

Fig. 2.5 Geomorphological position of brickyard section (after Ložek and Havlíček 1995).
1. Soil sediments; 2. Colluvial deposits (clay with limestone debris); 3. Sandy gravel (Middle and Lower Pleistocene terraces); 4. Alluvial plain of the Dyje river; 5. Loess and loess derived sediments; 6. Pre-Quaternary formations.
The line of short dashes indicates the position of the Pavlovian 'cultural layer'.

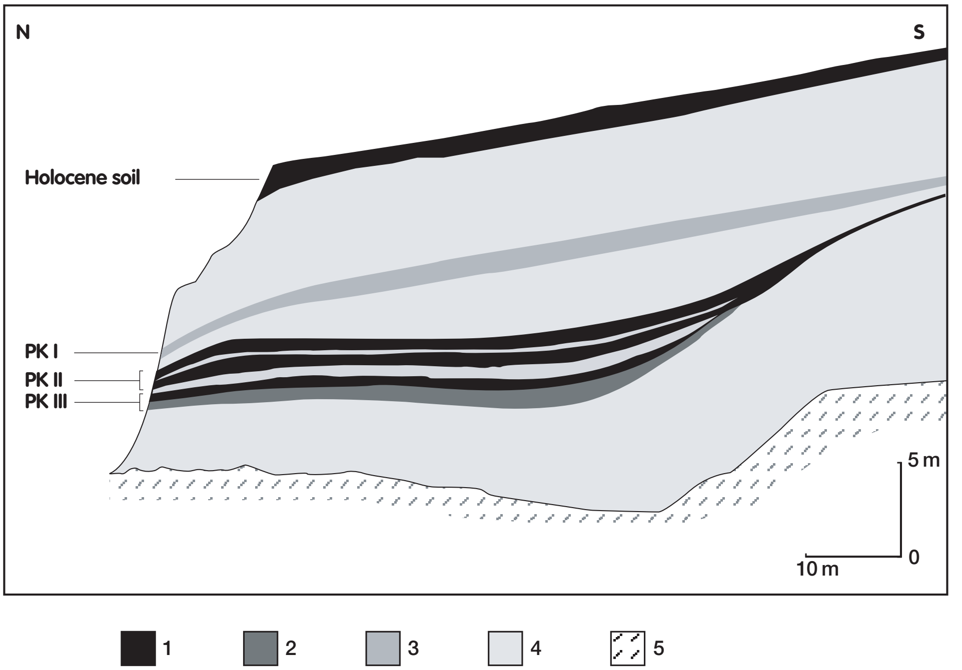

Fig. 2.6 Schematic representation of the Dolní Věstonice brickyard section (after Klíma et al. 1961).
1. Chernozem; 2. Bt-horizon of a *Parabraunerde*; 3. Cambisol; 4. Loess; 5. Pre-Quaternary subsoil.

between hydromorphic, stratified silt loam below and a pure, aeolian loess on top (Haesaerts 1990b, 535).
This lithological bipartition is interpreted as a change from humid cold to dry cold climate. Molluscan data support this interpretation. Ložek (1964) distinguishes three fauna for the time period under consideration.

1. Associated with the basal soil or soil sediment (PK I) is the poorly preserved, moderately temperate Striata fauna with *Helicopsis striata*.
2. The cold and humid Columella fauna is often found in association with gleysols and stratified silt loams.
3. The aeolian loess usually contains a cold and dry Pupilla fauna, significantly dominated by the species *Pupilla loessica*.

The climate change is probably due to changing atmospheric circulation caused by the Fennoscandinavian and Alpine ice sheets resulting in below average precipitation in Central Europe (French 1996, 224).

2.3.3 ENVIRONMENTAL TRENDS

These climatic trends also influenced the ecology of Central Europa. The data for palaeoecological reconstructions consist of pollen curves from river channel infillings, pollen profiles from loess sections, charcoal samples and faunal remains. Correlations between these datasets are based on stratigraphic position and C14 dates.
The pollen data from river channels do not provide a regional picture, because of their small effective area.
The most important pollen curve is from Bulhary (South Moravia, Czech Republic) (Rybníčková and Rybníček 1991) (figure 2.6). The 50 cm peat layer in Bulhary represents the infilling of a channel in the Dyje river bed. The curve shows a gradient from open herbaceous and grassland (steppe) environments to a nearly forested landscape. It contains pollen of thermophilous trees such as *Quercus* and *Fagus*. The gradient is probably the result of the gradual infilling of the channel. Afterwards the peat layer was buried by loess. The layer has been dated to 25,675 +2,750/-2,045 kyr BP. Despite the large standard deviation, the layer can be correlated with the last phase of the interstadial. The evidence from Bulhary is in good agreement with pollen analysis of the Stillfried B soil sediments (figure 2.4). Frenzel (1964) concluded that:

the amelioration of climate during the "Stillfried B-Interstadial" […] was strong enough to enable local sub-alpine conifer forests and riverine broad-leaved forests to spread along the rivers and other suitable places within the still dominant steppe formations on the drier loess plateaus (Frenzel 1964, 5).

The pollen diagrams from loess sections at the palaeolithic sites of Dolní Věstonice II-west (Svobodová 1991) and Předmostí (Svoboda et al. 1994) provide some additional information. *Pinus* pollen dominate these poor and badly-preserved assemblages, because fir produces a large amount of very resistant pollen, which is easily spread over a vast area. The general trend demonstrates decreasing proportions of arboreal pollen from the basal interstadial soil sediment to the aeolian loess[6]. Thermophilic species (*Ulmus, Fagus, Quercus, Carpinus* and *Fraxinus*) have also been identified in small numbers, though reworked and redeposited older 'loess' may be responsible for their presence. Anthracological analysis of hearth remains complements this picture. Most charcoal is identified as *Pinus*, but more exigent species occur as well (Mason, Hather, Hillman 1994, Opravil 1994, Damblon 1997).
Some thermophilic species have consistently been demonstrated in the southern parts of the region, i.e. south of Silesia, Poland and the Carpathians. The pollen curve from Nowa Huta (Poland), north of the Carpathian mountains and closer to the ice sheet, does not contain thermophilic trees (Kozlowski 1990) (figure 2.4). It indicates that the main climatic divide was probably formed by the Carpathian mountains. The micro-climatic conditions in the Middle Danube Basin, Vienna Basin and protected river valleys provided local environments for the survival of these thermophilic tree species.
Klíma (1963a) described the Pleniglacial environments as a transition from tundra to steppe conditions. Though the terms signal a change in humidity, 'tundra' and 'steppe' refer primarily to vegetation types. The tundra is a wet, mainly treeless vegetation type, such as is present in today's arctic. Reference to the tundra type is probably based on extrapolation from the present-day, i.e. interglacial vegetation zones, into the Late Pleistocene. However, it does not seem an adequate term for the vegetations of the Central European Pleniglacial since none of the vegetation types can be described as wet. Steppe vegetation types, i.e. dry, open and diverse vegetations, usually poor in trees, were probably of great importance throughout the period (cf. the concept of the mammoth steppe: Guthrie 1990, also Guthrie and van Kolfschoten 2000), with a gradual change towards more arid steppe vegetation types.
The large mammals have a considerable environmental tolerance and their mobility is usually large, which makes them less suitable for reconstructions of local environments. However, at a regional scale, the faunal remains are in good agreement with steppe vegetation types. Most species are indicative of cold, open and steppe environments: woolly mammoth (*Mammuthus primigenius*), horse (*Equus caballus*), reindeer (*Rangifer tarandus*), polar fox (*Alopex lagopus*), wolverine (*Gulo gulo*) (Musil 1994, 1997). Small mammals such as the European suslik *(Citellus (Spermophilus) citellus*) and the common hamster (*Cricetus cricetus)* are also

adapted to open and dry landscapes. Through time, a decrease in species diversity and probably faunal richness can be deduced, though the data are insufficient to be conclusive (Pichler 1996).
In short, the environment gradually changed from a moderately cold and humid steppe to a dry, cold, loess steppe. Latitude and altitude, local relief and lateral subsoil change all contributed to a general mosaic character of these environments.

2.4 The Pavlovian: a sketch

In the preceding pages, an outline of the region, its stratigraphy and natural environments has been described. I shall now place the Pavlovian settlement in its regional context. First, the Pavlovian will be defined as an archaeological culture and its stratigraphic position will be described. Second, the 'living area' of the Pavlovian will be outlined on the basis of lithic and molluscan evidence. Finally, I shall introduce some general aspects of Pavlovian settlement such as site-differentiation, site-location and the use of caves.

2.4.1 DEFINITION

The term 'Pavlovian' was introduced with reference to the site of Pavlov I (South Moravia, Czech Republic). Klíma (1967) defined the Pavlovian as a characterization of a group of large sites that shared several features: similar environmental conditions and means of production, similar social and economic relationships, similar settlement structures, similar religion. The assemblages also had a lithic and bone industry in common as well as works of figurative and geometric art. In this sense, the Pavlovian refers to a particular kind of settlement and its interpretation. This strict sense has gradually made way for a wider application: the Pavlovian as the early phase of the Central European Gravettian.
This typo-chronological definition is now widely accepted (Kozlowski 1986, Svoboda 1996b). Within the Pavlovian, a division can be made between an early and evolved phase (Svoboda 1994b, 1996b).
The characteristics of Pavlovian stone assemblages are a stone technology aimed at the production of narrow and thin blades, the frequent presence of backed micro-denticulates, points and pointed blades with ventrally retouched bases and generally a dominance of burins over blade endscrapers (Svoboda 1996b). Shouldered points are absent. These are characteristic of the later phase of the Gravettian, known as the Willendorf-Kostienkian (Kozlowski and Sobczyk 1987, Svoboda 1994b, Sobczyk 1995, Hromada 1997).
Stratigraphically, the Pavlovian is located in the upper part of the PK I soil sediments and the laminated silt loams on top of the PK I. The environmental conditions correspond to a somewhat humid, moderately cold, mosaic steppe environment before the onset of the arid phase of the Pleniglacial. The Alpine and Fennoscandinavian ice-sheets had not reached their maximum extension by far. In chronological terms, it is defined as the period between 29 and 24 kyr BP.

2.4.2 A GEOGRAPHY OF THE PAVLOVIAN

I shall now look at some aspects of the palaeolithic settlement of Central Europe within these chronological limits. A variety of archaeological traits can be investigated to provide the contours of the Pavlovian 'living area' or range. The Pavlovian 'living area' must not be mistaken for a bounded territory of a particular social entity. It is just the rough outline of an area that was exploited and inhabited in the Pavlovian phase of the Central European Gravettian. The distribution of sites attributed to the Pavlovian phase forms the primary basis for this spatial definition. A particularly well-studied aspect of the Central European Gravettian, and very useful for our purpose, is the distribution of lithic raw materials. Finally, molluscan evidence has been invoked with reference to interregional networks.

2.4.2.1 Distribution of Pavlovian sites

In recent years, several overviews of the palaeolithic occupation of particular Central European countries have appeared (Svoboda et al. 1994, Svoboda, Ložek, Vlček 1996, Kozlowski and Kozlowski 1996, Valoch 1996, Neugebauer-Maresch 1999, Dobosi 2000). On the basis of these publications, the Pavlovian 'living area' can be outlined in general (the sites mentioned in the text are shown in figure 2.7).
One of the most northern sites attributed to the Pavlovian is Wójcice (Silesia, Poland) (Dagnan and Ginter 1970). It is located in the area of the Saale- and Elster-moraines north of the Sudete mountains. Another northern site is Obłazowa cave in the Pieniny mountains in the Polish Carpathians (Valde-Nowak 1991). Layer VIII of this site contains a small assemblage in which an ivory 'boomerang' is present (Valde-Nowak et al. 1987). The stratigraphic position of layer VIII suggests an attribution of the assemblage to the Pavlovian. Unfortunately, the results of C14 dating are not consistent with this interpretation. Dates for layer VIII are widely dispersed: the 'boomerang' was dated to 18,160 ± 260 BP (OxA-3694), whereas a human phalange is dated to 31,000 ± 550 BP (OxA-4586[7]). Moreover, the underlying layer XI was dated to 23,420 ± 380 BP (OxA-3695) (Hedges et al. 1996). At present, the age of the Obłazowa assemblage remains unclear. Several other Polish sites are attributed to the Pavlovian, but their stratigraphic position is often inconclusive and the assemblages are usually too small to allow a precise attribution (Kozlowski and Kozlowski 1996, 64/65).
The southern and eastern limits of the Pavlovian living area are located in the Hungarian plain. One of the candidates for Pavlovian occupation of the Middle Danube Basin is Nadap (Dobosi et al. 1988). The small assemblage is located above sediments correlated with the Mende Upper soil and below

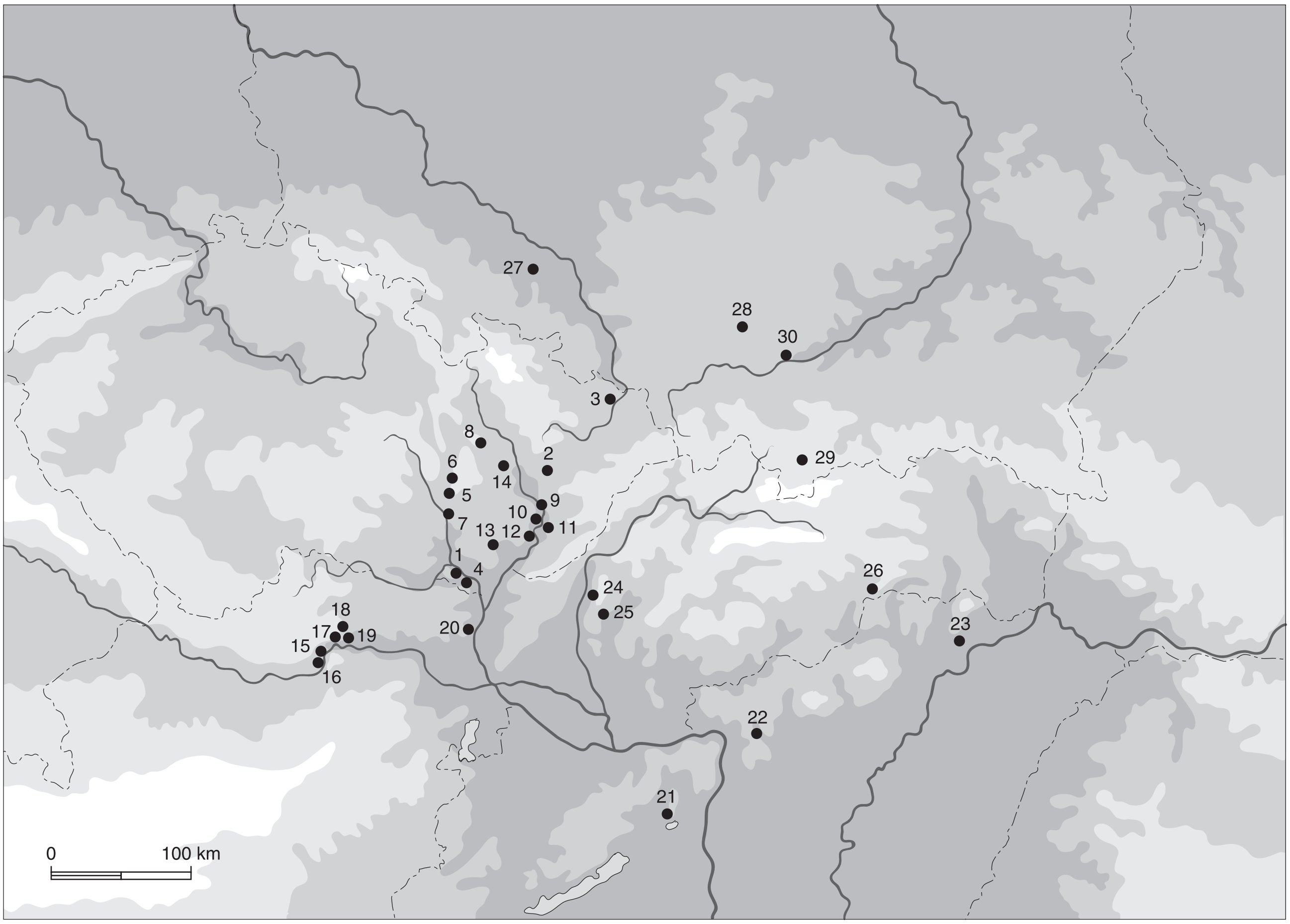

Fig. 2.7 Distribution map of sites mentioned in the text.
Czech Republic: 1. Dolní Věstonice-Pavlov; 2. Předmostí; 3. Petřkovice-Landek; 4. Milovice; 5. Pod hradem-cave; 6. Kůlna-cave; 7. Brno; 8. Mladeč-Plavatisko; 9. Napajedla-sites; 10. Spytihněv; 11. Jarošov; 12. Boršice; 13. Kyjov; 14. Blatec.
Austria: 15. Willendorf; 16. Aggsbach; 17. Krems-Wachtberg; 18. Stratzing/Krems-Rehberg; 19. Langenlois; 20. Stillfried.
Hungary: 21. Nadap; 22. Püspökhatvan; 23. Bodrogkeresztur.
Slovak Republic: 24. Moravany-area; 25. Certova pec; 26. Slaninova-cave.
Poland: 27. Wójcice; 28. Dziadowa skała; 29. Obłazowa-cave; 30. Krakow-area.

two humic layers, correlated with h1 and h2 in the Hungarian loess stratigraphy. On the basis of this stratigraphic position the site is dated between 28 and 22 kyr BP. However, a horse bone from the excavation is dated to 13050 ± 70 BP (GrA-16563). Typologically and technologically, the assemblage is generally Gravettian with backed bladelets and points. Further dating will solve the discrepancy between the stratigraphic interpretation and the C14 date.
The traces of Pavlovian further east in the Carpathian basin are controversial. The Pavlovian or early Gravettian attribution of Bodrogkeresztur-Henye hegy is partly based on the C14 date of 28,700 ± 3,000 BP (GXO-195) (Vértes 1966). In addition to the large range of this date on a bulk sample of charcoal close to the surface, the industry itself is, in my opinion, somewhat different from the Pavlovian. The industry is dominated by local raw materials. Endscrapers are more frequent than burins and backed elements are rare.
My impression of the material is that it has rather more of a Late Aurignacian character. The Hungarian site of Püspökhatvan-Diós is dated to 27,700 ± 300 (Deb-1901) (Csongrádi-Balogh and Dobosi 1995). The stone industry contains no backed elements, is mainly on local raw materials and its general character is, in my opinion, more Aurignacian. The dated sample is a bulk sample of charcoal, from close to the modern surface and some contamination cannot be excluded.
Another instance is formed by the few finds of the Slaninova cave (Slovakia): two retouched blades, two ivory points and a hearth. A bear bone from the same layer is dated to 27,950

± 270 BP (GrN-14832) (Kaminská 1993). An attribution to the Pavlovian is based solely on the C14 date, which gives only a rough indication of the age of the archaeological remains. The site of Cejkov I has two early C14 dates: 28,900 ± 900 BP and 27,400 ± 1,400 BP (laboratory number unknown). The associated assemblage remains to be studied in detail. Evidence of Upper Palaeolithic settlement in the Carpathian Basin was also discovered in the Transcarpathian part of the former Soviet Union, now the Ukraine. However, these traces do not seem to belong to the Pavlovian. Generally, the evidence from Carpathian Basin points to an occupational hiatus between approximately 28 kyr (Late Aurignacian) and 22 kyr (Late Gravettian and Epigravettian). It can be concluded that the Pavlovian occupation of the Carpathian Basin was incidental and limited. East Slovakia seems to be the most promising area for Early Gravettian occupation.

The western limits of the Pavlovian 'living area' are provided by the sites in the Wachau (Austria), Aggsbach and Willendorf II in particular (Otte 1981, Neugebauer-Maresch 1993, 1999). However, hardly any research has taken place upstream of the Danube in Austria. Several Gravettian sites are known from Bohemia (cf. Otte 1981). It is not clear how these assemblages relate to the Pavlovian. Further west, the assemblage of the Weinberghöhlen in Mauern (Southern Germany), in a tributary valley of the Danube, has been described as Pavlovian (Klíma 1968). In my opinion, the assemblage is better understood in the context of the South German Gravettian (Hahn 2000, Scheer 2000).

2.4.2.2 Lithic raw materials

The distribution of lithic raw material provides additional information on the spatial limits of Pavlovian living areas (figure 2.8). Due to the complex geological history of Central Europe, the region has an enormous variety of more and less suitable raw materials. Good quality flints are particularly widespread in South Poland and Silesia (Kozlowski 1989). Moraines, deposited by the Saalian and Elsterian ice sheets, contain silices known as 'northern', 'Nordic', 'erratic', 'Baltic' or 'glacial' flints. The moraines reach as far south as the Moravian Gate. Some of the 'erratic' flints are reworked in Bečva and Morava gravels. The 'northern' flints occur frequently all over the Pavlovian 'living area'. They have been found in the Aggsbach and Willendorf localities in Lower Austria. They make up the majority of the Pavlov Hills assemblages. More than 60% of this 'erratic' flint is mentioned from the site of Nadap (Dobosi et al. 1988) at the southernmost limit in Hungary. It is also common in the later Willendorf-Kostienkian assemblages in the Moravany region in Slovakia (Hromada and Kozlowski 1995). Limestone formations in the vicinity of Krakow also contain good quality flint, both in primary contexts and in secondary rock waste. Some artefacts of this Krakow-Czestochowa Jurassic variety were identified in the Pavlov I assemblage (Příchystal, in Verpoorte 1997). In a small sample studied petrographically, one Pavlov I artefact was significantly different from South Polish samples in its chemical properties. According to Příchystal (1994), it was similar to Volhynian flint from the East European Platform. The Pavlovian exploitation of this northern sphere is therefore well established by the distribution of these flint varieties.

Radiolarites also have a wide distribution. They occur in many different colours among which the red and green varieties dominate. Sources are found in the Carpathians as well as the Alps and some parts of north-western Hungary (Biró and Dobosi 1991). Particularly well-known is the source in the Vlárá pass region in the White Carpathians on the Czech-Slovak border (Skutil 1963, Cheben et al. 1995). They also occur in the fluviatile deposits of the Váh and Danube. The cortex of the Pavlov and Dolní Věstonice radiolarites demonstrates that it was usually obtained from rock waste slope deposits. The radiolarites from Krems-Wachtberg, Lower Austria, were probably collected in fluviatile gravel deposits such as the nearby Tulln field (pers. comm. T. Einwögerer 1999). Radiolarite artefacts are also found in Wójcice (Otte 1981) and Nadap (Dobosi et al. 1988).

In addition to these raw materials, the occasional finds of obsidian are of interest (e.g. Dolní Věstonice I, Pavlov I and Stillfried-Kranawetberg, pers. comm. W. Antl-Weiser 1997). The obsidian may originate in the East Slovakian Zemplín Mountains (Carpathian 1 group: Williams Thorpe et al. 1984, 195), but the obsidian from Dolní Věstonice I and Pavlov I is somewhat different from the known Hungarian and East Slovakian sources (Přichystal pers. comm. 1998).

Rock crystal is frequently present in a few fragments (e.g. in the Pavlov Hills, Willendorf and Aggsbach). It can be found in the Alps as well as the valleys of the Bohemian Massif, but also in secondary river terraces (Škrdla et al. 1996, 175).

Next to these raw materials, there are many, more locally distributed raw material sources: Moravian cherts (e.g. Krumlovský les chert, Stránská skála chert) [8], Moravian and Lower Austrian quartzites, Slovakian and Hungarian limno- and hydroquartzites, chalzedony, silicified marlstone and so on.

The distribution of sites and lithic raw materials provides insight in the Pavlovian occupation of Central Europe. They indicate a Pavlovian 'living area' connecting the loess plain in the north, the Austrian Wachau in the west and the Carpathian Basin in the south, extending maybe further into Hungary. The highest density of settlement traces is found in Moravia.

2.4.2.3 Molluscan evidence

Interregional relations linking Moravia and Lower Austria with the Mediterranian have been claimed on the basis of

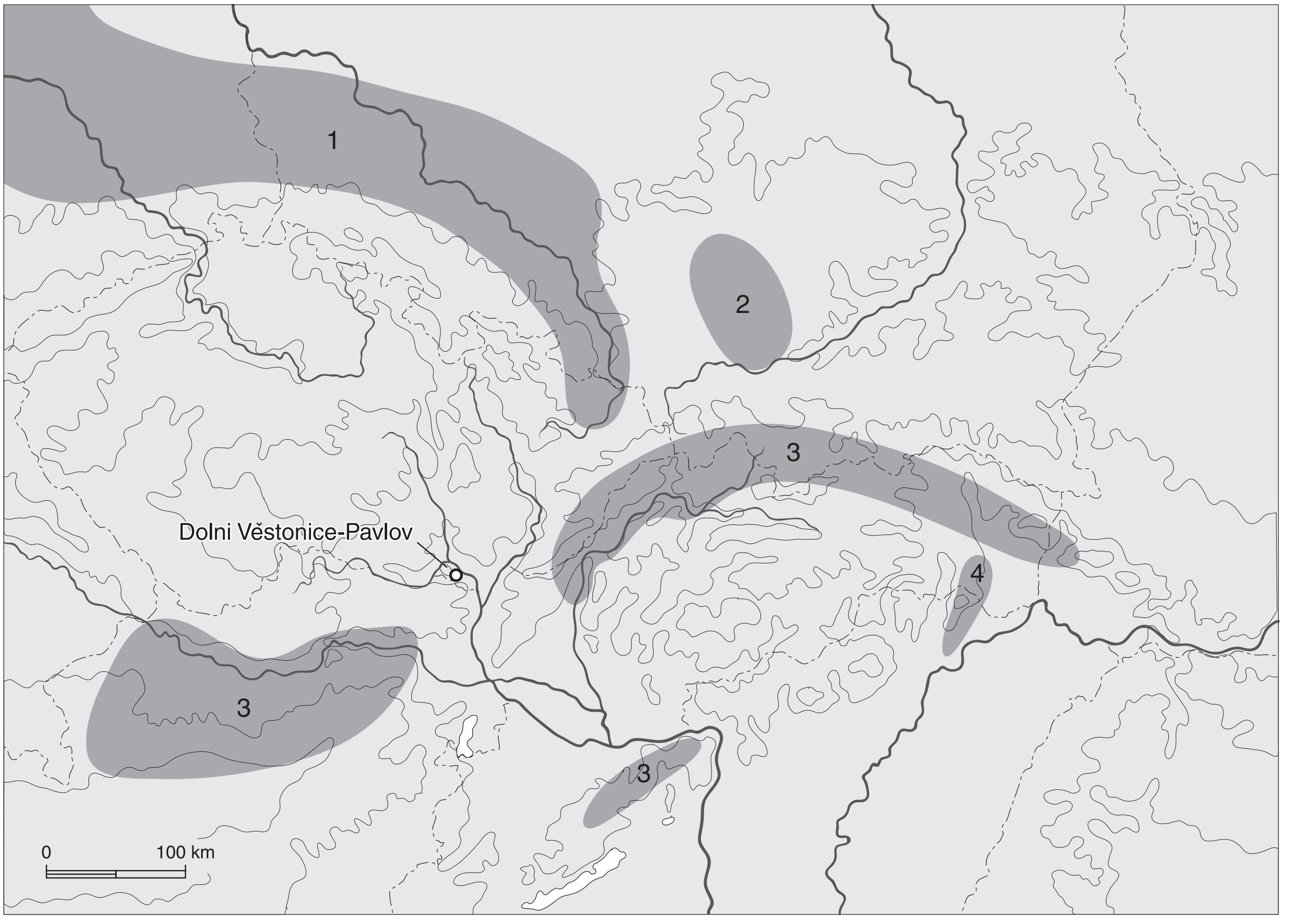

Fig. 2.8 Distribution map of main raw material source areas (dark areas).
1. Glacial silices (moraines); 2. Krakow-Czestochowa Jurassic flint; 3. Radiolarites; 4. Obsidian.

molluscan evidence (Otte 1981, 63). It concerns here contacts with other regions than the ones providing non-local lithics. The evidence for such long distance contacts has been related to the existence of extensive exchange networks (Rensink, Kolen, Spieksma 1991). Fossil molluscs have been discovered at a number of sites, sometimes pierced or ochre-stained. Most of them can be found in the Miocene deposits of the Vienna Basin and the Middle Danube Basin (Hladilová 1994)[9]. The evidence for long distance contacts comes from the Pavlovian site of Pavlov II in Moravia and two Willendorf-Kostienkian sites from the Moravany-region in Slovakia.

An exceptionally well-preserved, pierced specimen of *Turritella* ex gr. *subangulata* is mentioned as a foreign element among the 67 pierced molluscs of Pavlov II: 'On the basis of the weak surface polish of the shell, this species could even be determined as a subfossil admixture from the Mediterranean' (Klíma, 1976, 43). This weak gloss, however, could also be attributed to the geological context of both the Miocene sands in which the species can be found ánd the silt loams of Pavlov II as well as to the handling of the object by palaeolithic hands. There are no sufficient grounds for such a far-reaching conclusion.

From Moravany-Podkovica and –Lopata(-I), *Cypraea (Zonaria) sanguinolenta* is mentioned as being probably from the Mediterranean (Bárta 1970, 209). Both sites are attributed to the Willendorf-Kostienkian phase. This species occurs however in the Indo-Pacific from Miocene to recent times and not in Europe. It is possible that *Zonaria columbaria* is meant, a very similar species that can be found in the Miocene deposits of the Vienna Basin.

Reasonable doubt can be cast on the evidence supporting interregional contacts with the Mediterranean. The assumption that the molluscs circulated in extensive exchange networks is, in my opinion, not corroborated by the available evidence. In fact, the molluscan evidence from archaeological sites is by and large consistent with the outline of the Pavlovian 'living area' as based on the distribution of sites and the lithic raw materials.

2.4.3 Aspects of Pavlovian settlement

2.4.3.1 Site differentiation

A characteristic of the Pavlovian is the occurrence of extremely large sites such as the ones in the Pavlov Hills central to this study. In the original definition of the Pavlovian, Klíma (1967) focussed on this peculiar kind of site or site cluster. He interpreted these sites as large settlement areas, occupied for long periods of time (Klíma 1963a). Due to terrain circumstances (e.g. landsliding and solifluction) and economic conditions, the settlements were relocated frequently in the vicinity.

Most authors generally agree with this interpretation. Otte (1981), for example, writes about Dolní Věstonice I and Pavlov I, that:

These two sites not only provide traces of prolonged and repeated settlement (cleaning of hearths before reutilization at Pavlov, successive layers at Dolní Věstonice), but also of numerous structures of various types, an abundant toolkit, evidence of aesthetic activities and burials. The very importance of these remains allows to suppose a semi-permanent habitation for at least part of a group. […] The site of Předmostí, in the north of Moravia, excavated too early, but containing all types of remains (burials, rich tool assemblage, art, important faunal remains), corresponds undoubtedly to a semi-permanent base camp as well (Otte 1981, 130).

According to Kozlowski (1986):

The sites in Moravia […] were probably occupied year-round. From there, trips were made to procure flint or to new hunting grounds, leaving archaeological traces such as flint workshops (as in upper Silesia and near Kraków) or short-term hunting camps in the caves of Moravia, Slovakia […], and Poland […] (Kozlowski 1986, 179).

And:

The predominantly regional grouping of sites is indicative of prolonged settlement in microregions within which there was a gradual shift of more or less permanent base settlements, with hunting groups wandering in the vicinity (Kozlowski 1986, 180).

I shall return to the interpretation of the character of these sites later in chapter 8. Here it must be noted that there exists a profound differentiation of Pavlovian sites, if not a site hierarchy. The presence of the large sites forms the crucial difference with both earlier and later periods of the Upper Palaeolithic.

2.4.3.2 Site location

Pavlovian sites are strongly associated with the main river valleys of Central Europe (Otte 1981, Svoboda, Ložek, Vlček 1996). Usually they are located near the confluence with a smaller tributary river. Their position upslope provides a good view over the river valleys. The strategic importance of this view for the success in hunting may have been one of the reasons for this preferential site location. Another reason why archaeologists find sites at these locations is the exposure of sediments from the relevant timespan. The main loess cover often post-dates the Pavlovian settlement and its traces may therefore be covered by considerable amounts of loess. Sites are usually found where the loess cover is widely eroded e.g. by smaller rivers and dry valleys or where the loess is exploited for the production of bricks.

2.4.3.3 Open-air sites and caves

Another characteristic of the Pavlovian is that most sites are open-air sites, unlike the situation of the Gravettian (and Perigordian) in Western Europe. The Gravettian cave assemblages are typically small to very small, providing evidence of some hunting tools and one or more hearths. They are usually not dated and can rarely be attributed to the Pavlovian phase specifically. Usually an attribution to the Gravettian is based on the stratigraphic position in combination with some tooltype.

In the Pod hradem cave in the Moravian karst, a hearth with only four artefacts is dated to 26,830 ± 300 BP (GrN-1981) (Valoch 1965, Kukla 1968). The same layer contained a small faunal assemblage with bear, reindeer, wolf, polar fox, horse, hyena and roe deer, mostly young animals and partly gnawed by wolf. In the Polish cave of Dziadowa skała, only four artefacts — amongst which a Gravette-point — were found in a layer with several, maybe seven, small hearths (Chmielewski 1958). Though the Hungarian caves are not well dated, some small assemblages may be attributed to the Gravettian (Allsworth-Jones 1986, Dobosi and Vörös 1994). The cave of Certova pec in Slovakia contained a very small assemblage with several fossil molluscs (Bárta 1963). Somewhat exceptional is the Gravettian (Willendorf-Kostienkian?) occupation of the Kůlna cave, which also yielded decorated bone and ivory artefacts (Valoch 1988). Among the cave assemblages, it belongs to the larger ones, but it is marginal compared to the major open air sites in the region.

One explanation for the scant occupation of caves and rock shelters is that sediments from the 30-15 kyr time period are rarely preserved. In Central Europe, the sediments from the period are either eroded later on or the period itself is characterized by erosional episodes. A case in point is the partly eroded layer in the Kůlna cave (Valoch 1988). Despite the importance of post-depositional processes in the conservation of sites, the small assemblage size cannot be attributed solely to these processes, but also signals the marginal occupation of the caves and rock shelters. In conclusion, the use of caves and rock shelters in the Pavlovian (and the Gravettian) was probably restricted to short overnight stays during a hunting trip or another expedition (Bárta 1963, Kozlowski 1986, 136).

2.4.3.4 Long-term trajectories

Another way to characterize the Pavlovian is to compare it with the earlier Aurignacian and the later Willendorf-Kostienkian, Epigravettian and Magdalenian. Such an approach demonstrates some profound changes in site differentiation and site distribution patterns in the Central European Upper Palaeolithic (Svoboda, Ložek, Vlček 1996).
Compared to the Pavlovian, the later Willendorfian-Kostienkian shows a decrease in site-differentiation. The site clusters of Moravany (Slovakia) and Krakow (South Poland) are smaller, less dense and less rich than the site clusters of the Pavlov Hills and Předmostí in Moravia. Where Pavlovian settlement was focussed on Moravia, Willendorf-Kostienkian settlement was tied down to Slovakia (Moravany-area), South Poland (Krakow-area) and possibly Austria (Willendorf). A shift in the location of site clusters — not of the total range as such — accompanies the change in site differentiation.
Both the Pavlovian and the Willendorf-Kostienkian site distribution pattern can be characterized as more or less linear. The Gravettian sites are strongly associated with the main river valleys: Morava, Dyje, Váh, Danube, Wisła (Weichsel). In contrast, the Aurignacian site distribution pattern is more nucleated on plateaus and plateau edges (Oliva 1987, 1993). In Moravia, Aurignacian sites tend to be located at higher altitudes than the Gravettian ones (Svoboda, Ložek, Vlček 1996). Site clusters, similar to the Gravettian ones, are absent. Also, Aurignacian assemblages are usually dominated by local raw materials. From the limited data on Epigravettian occupation, we can conclude that the site distribution pattern is dispersed, sites are usually smaller and local raw materials are dominant (Montet-White 1994, Hromada and Kozlowski 1995). The Magdalenian settlement of Central Europe is concentrated on caves, in particular the Moravian karst, unlike any of the earlier Upper Palaeolithic phases (Svoboda, Ložek, Vlček 1996).

2.5 Conclusion

The Pavlovian is defined here as the early phase of the Gravettian in Central Europe, roughly dated between 29 and 24 kyr BP. It preceeds the temperature minimum of the Last Glacial, the maximum extent of the Weichselian ice sheets and the major phase of loess sedimentation. It developed in a glacial environment characterized as a moderately cold and humid steppe vegetation inhabited by herds of large herbivores and a variety of large and small carnivores. The distribution of Pavlovian settlement traces stretches across a large part of Central Europe from South Poland to the Wachau in Austria and the northern parts of the Hungarian basin. It is clearly focussed on the Moravian lands, where settlement is concentrated in several site clusters.
My aim in this chapter was to provide a general introduction to the Pavlovian from a regional perspective. By situating this archaeological culture within a geological and stratigraphical framework, and within the development of the Central European Upper Palaeolithic in general, this chapter provides some background information for a detailed study of the anthropomorphic figurines of the Pavlovian.

notes

1 PK III consists of the Bt-horizon of the forest soil and the lower chernozem. PK II consists of the upper two chernozems.

2 These ‘Gley’-horizons are sometimes included in PK I.

3 Both dates are to be considered as minimum ages (de Vries in Klíma et al. 1961, 139). In the case of GrN-2102, recent contamination cannot be excluded.

4 Klíma refers to this feature as a ‘pals’, but this term usually refers to similar phenomena in organic materials such as peat.

5 See the contributions in *La stratigraphie des loess d’Europe*, 1969. These soils are usually correlated with the Bryansk and Dunaevo soils from the Ukraine and Russia (see Soffer 1985, 27-29 for comments).

6 The high arboreal pollen sums (30 up to 70%) in the loess sections are the result of selective preservation of these pollen and not indicative of a ‘forested’ environment.

7 Two other dates from layer VIII are 30,600 ± 550 BP (OxA-4585) and 32,400 ± 650 BP (OxA-4584). The ‘boomerang’-date may be too young due to contamination. The layer VIII can be considered to date to approximate 31 kyr BP and an attribution to the Aurignacian is then more likely.

8 Škrdla et al. (1996, 184) also mentions a ‘shadowy’ spongolitic chert whose inner structure is similar to samples from Eastern Bohemia (Ústí nad Orlicí), but the colours are different.

9 I would like to thank A.W. Janssen, National Museum of Natural History, Leiden, for the information on species names and their distribution in the Miocene sediments of the Central Paratethys.