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Crimea in the Context of the Eastern European Middle Paleolithic and Early Upper Paleolithic

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Crimean and Eastern European Paleolithic studies have traditionally taken place within a cultural-historical paradigm. On the basis of often no more than proportional variations within shared toolkits, Middle and Upper Paleolithic assemblages have been divided into a number of "archeological cultures" (Gladilin 1976, 1985; Praslov 1984b; Rogachev and Anikovich 1984; Kolosov 1986; Anikovich 1992; Sytnyk 2000; Anissutkine 2001) or, even, "paleo-ethnic groups" (Stepanchuk 1999). To explain typological variability among seemingly different industries, the advocates of the cultural historical approach have appealed to "interactions" between cultures/paleo-ethnic groups. This has been most clearly manifest in studies of the Middle to Upper Paleolithic "transition," where, as for Western Europe (Mellars 1996; Gamble 1986), an acculturation hypothesis between local Middle Paleolithic and Aurignacian "invaders" has been incorporated into Eastern European Paleolithic studies to account for local, specific Early Upper Paleolithic industries (Amirkhanov et al. 1993; Cohen and Stepanchuk 1999, 2000; Anikovich 2000; Vishnyatsky 2000: 261).

"Interactions," if not acculturation, certainly must have taken place during the Paleolithic, but the huge area and the apparent very low Paleolithic population densities in Eastern Europe argue for only limited ones; too limited to serve as an overarching explanatory model for either typological or technological variability. While such might have occurred, there is very little archeological evidence for externally driven change. The one exception may have been, perhaps, in regions rich in needed and variable resources, which may have served as refugia during particularly harsh climatic conditions.

Climatic warming events are assumed to be a primary factor in the dispersal of humans, allowing them freer and more widespread access to fruit-bearing trees and the mammalian diversity that accompanies the spread of warm-temperate forest and woodlands (Speleers 2000; Gamble 1999). In contrast, occupation of environmentally hostile areas with restricted carrying capacities, due to limited availability of consumable flora and fauna, would require accurate and detailed knowledge of resources, be they raw material, food, or habitable places. The flat, monotonous topography of most of Eastern Europe provided few natural shelters, and the generally more harsh climatic conditions, as compared to other parts of Europe, seems to have resulted in a relatively late and "marginal" occupation by humans (Hoffecker 2002:xvii).

Although regional clustering of sites may be more often than not a reflection of archeological fieldwork, it is necessary to identify all local environmental factors that might lead to an area appearing as a favorable habitat to Late Pleistocene people. Unfortunately, not every archeological site can be unequivocally linked to even a major climatic phase. Even in cases where palynological analyses have been conducted, it is not unusual for their interpretation to conflict with that of sedimentary or microfaunal studies. The reader will note that the following discussion is limited to in situ, and often, stratified sites. The great many surface sites and redeposited localities are important—once they can be correlated with more secure sites having biostratigraphic and chronometric data—but are outside the scope of this chapter. Of all Eastern European regions, Crimea now provides the most complete and varied data, at least for the Middle and Early Upper Paleolithic. Therefore, out of necessity, this synthesis will focus on Crimean data. If at times it appears that a more appropriate title might have been "Eastern European Middle and Early Upper Paleolithic in the Context of Crimea" this merely reflects the present state of Eastern European Paleolithic research, not prehistoric realities.

Lacunae in the knowledge base about environmental, chronometric, settlement, and technological systems during the time of the Last Interglacial through the Middle Pleniglacial are sorely evident. This has always been and will always be the case even as our research designs become increasingly refined. Yet, if even the limited nature of our current data allows for speculative syntheses such as this, our working hypotheses may lead to new research designs, provide impetus for carrying out region-specific broad spectrum analyses (that include palynology, absolute dating, micro- and macro-faunal programs, e.g.), and otherwise invite prehistorians to look outside their specific local area towards the commonalities that the Middle and Early Upper Paleolithic of Eastern Europe must necessarily share.

Geographic Limits

The geographic limits of Eastern Europe are the Ural Mountains to the east and Scandinavia, the Baltic Sea, the Carpathian Mountains, and the Lower Danube to the west. The northern border of Eastern Europe is the southern shore of the Arctic Ocean, while the southern border lies along the Ural River, the Caspian Sea shore, the Main Ridge of the Caucasus Mountains, and the northern Black Sea shore (Figure 25-1). Eastern Europe occupies a huge expanse, over 4.5 million square kilometers, or about the size of the contiguous United States. The entire area represents the eastern portion of the Great European Plain,

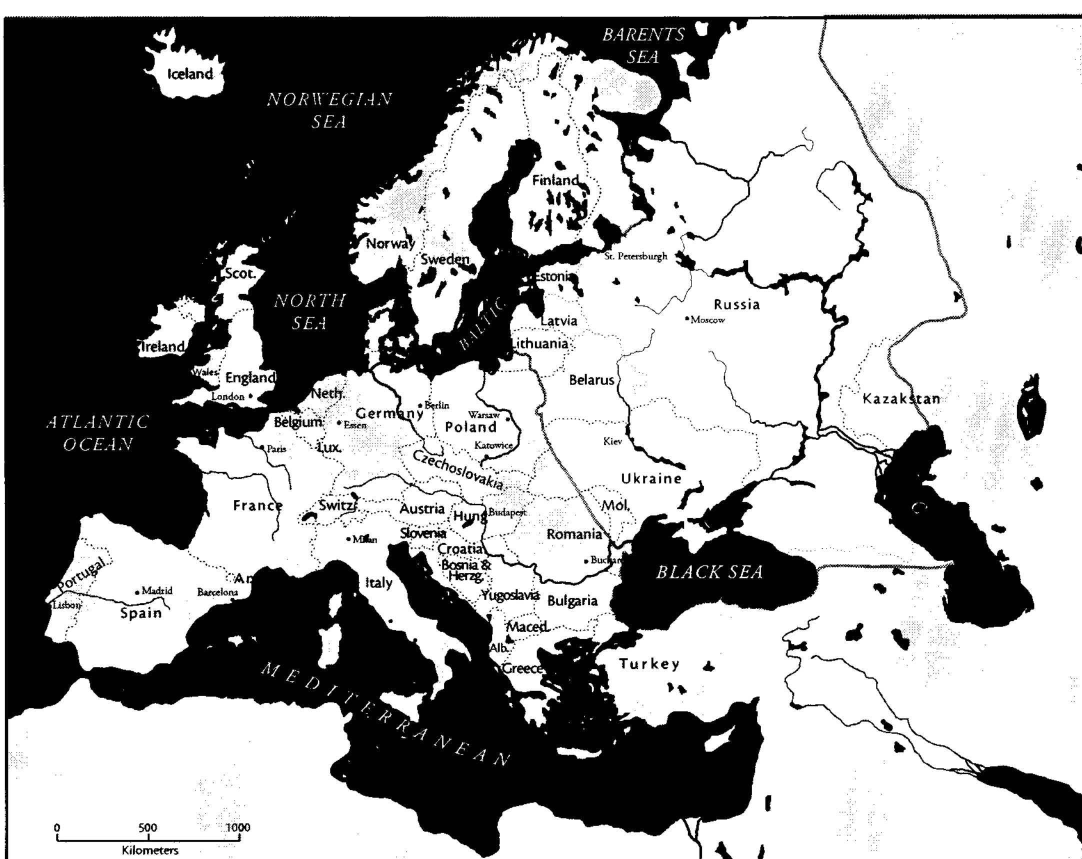

Figure 25-1—The limits of Eastern Europe.

which arcs across Europe and widens north to south between the Carpathian and Ural Mountains. This rolling plain is largely flat, with an average elevation of 200 meters above sea level (asl), broken up by a series of semi-circular hills of the terminal moraine that forms the Valdai Hills (maximum elevation 321 m asl), Central Russian Upland (340 m asl), and Volga Hills (330 m asl). To the southeast, the Oka-Don and Caspian Lowlands form depressions, with a minimum altitude of 28 m below sea level. The northern part of the European plain is poorly drained, with many swamps, marshes, and lakes. In contrast, the southern half of the plain is well drained with fertile soils. The extensive river system of Eastern Europe has a generally radial pattern of drainage, with the most important rivers (Dniester, Dnieper, Volga) draining to the south.

While the relentlessly flat topography of Eastern Europe might suggest an overall uniformity in those resources essential to Paleolithic peoples, this is far from the case. There were marked latitudinal environmental belts during the Pleistocene, from the ice sheet in the northern third of Eastern Europe to open steppe in the south. Not only did plant and animal resources differ according to these belts, but also the belts expanded and contracted with shifting stadial and interstadial conditions. On the other hand, environmental shifts, so strong on the Russian Plain, were relatively muted in Crimea, even under extreme cold conditions. Crimea was always habitable and it is therefore not surprising that there is evidence for human occupation throughout the Middle and Early Upper Paleolithic. This contrasts with the northern third of Eastern Europe, which was only habitable during the Last Interglacial—as hinted at by Eemian age finds in Finland (Schulz 2000–2001)—or in small unglaciated pockets just west of the northern Urals (Guslitzer and Pavlov 1993).

Partly following natural geographic boundaries and partly reflecting the history of Paleolithic field work in Eastern Europe, the following Middle Paleolithic and Early Upper Paleolithic "regions" of varying size traditionally have been recognized (Rogachev and Anikovich 1984; Gladilin 1985): the Mid and Lower Volga, the Mid and Lower Don, the Northern Caucasus, the Donbass (Donets Basin)-Azov region, Crimea, the Desna and Dnieper Rivers, the Polesye (Volynska), and the Prut-Dniester (Podolia) area. These regional divisions are likewise used in this report. The amount of information from each region varies considerably because of a combination of geological and historical factors. In spite of the large number of sites (Figure 25-2) often cited in syntheses of Eastern European Middle and Early Upper Paleolithic (e.g., Praslov 1984b; Cohen and Stepanchuk 1999; Hoffecker 2002), most cannot be used for detailed comparative analyses. The vast majority of sites lack stratigraphic and/or geological context, even many in situ sites are undated, and the problems of artifact mixture at surface sites is no different from other parts of the world. While such sites may provide supplementary information on site distributions, for instance, they cannot be used in temporal, regional, or developmental constructs. Therefore, although such sites will be mentioned, when useful, only in situ dated sites will be used as the framework of our understanding of the Eastern European Middle and Early Upper Paleolithic.

Past Environments: the Last Interglacial through the Middle Pleniglacial

Environmental and paleogeographic data from the Last Interglacial through the Denekamp (Arcy) Interstadial (ca. 128,000 to 28,000 BP) derived from various regions of Eastern Europe have allowed the reconstruction of past environments in ever-increasing detail. These reconstructions rely on pollen, bird and small mammal, medium- and large-sized faunal, and malacological analyses. In some regions, however, such analyses are spotty; the Prut-Dniester basins, Crimea, and the Don River Valley are the best documented.

Last Interglacial

During the Last Interglacial, the Karangat transgression—the result of eustatic oscillations in the Mediterranean Sea—caused sea levels in the Black Sea to rise 8 to 12 m higher than today (Dodonova et al. 2000; Chepalyga 1984:230). As a consequence, the mouths of the Danube, Dniester, Dnieper, and Don rivers were completely flooded, often replaced by brackish lagoons and extensive deltaic systems (Dodonova et al. 2000). At the same time, the Caspian Sea may have been connected to the Black Sea by the postulated Manych Strait. If so, the Northern Caucasus was separated from the rest of Eastern Europe by this channel (Chepalyga 1984:230) and Crimea may have been an island (Lazukov et al. 1981). To the far north, the Eemian Sea occupied the entire Baltic basin, turning Fennoscandia into an island and flooding the northwestern-most part of Eastern Europe (van Andel and Tzedakis 1996) (Figure 25-1).

In Crimea and around the northern Black Sea coast (south of 45°N), a steppe mammal community presided, typified by such small mammal fauna as *Ochotona pusilla* (steppe pika), *Spermophilus* (ground squirrel),

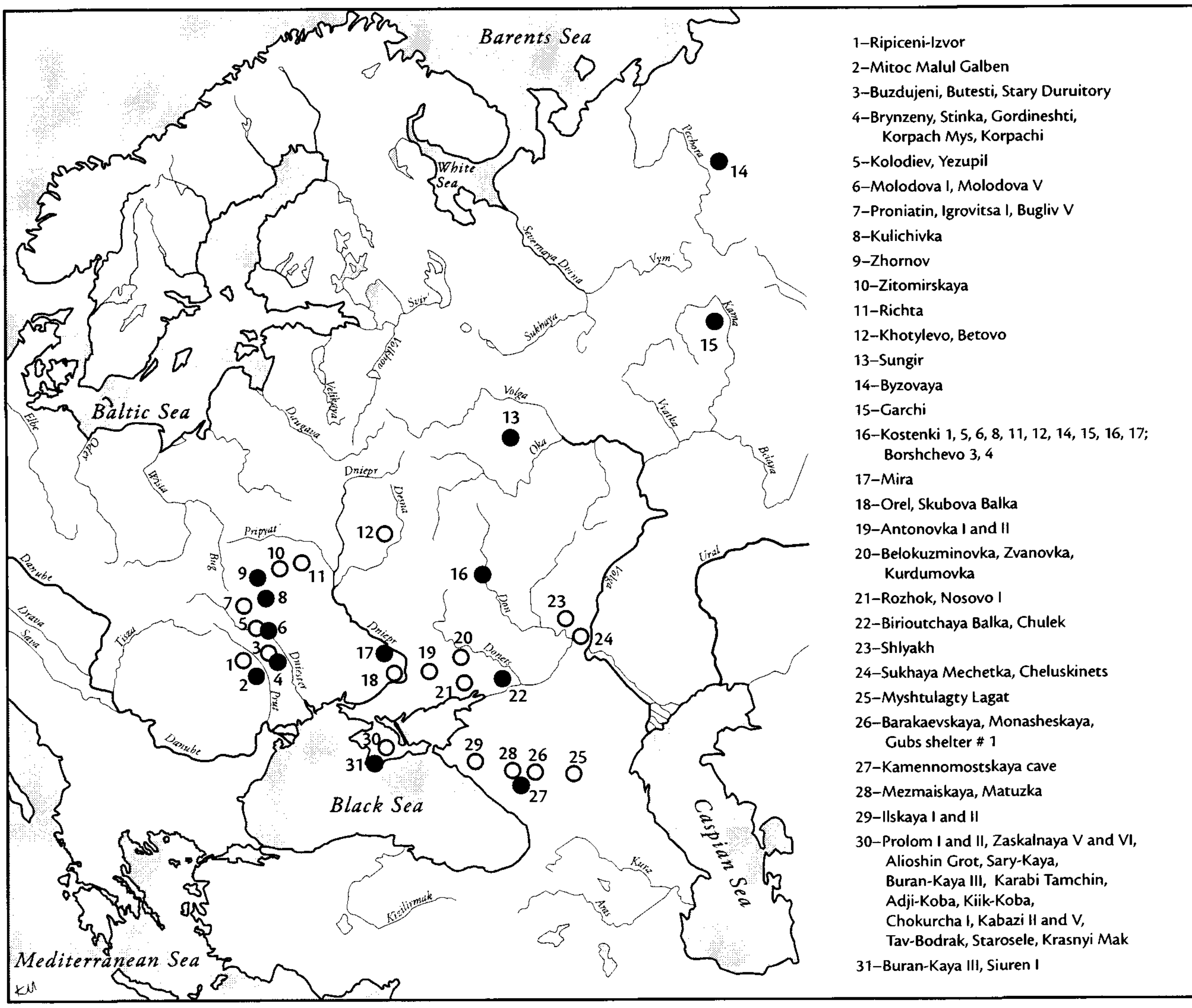

Figure 25-2—Eastern European Middle (o) and Upper Paleolithic (•) sites mentioned in text.

Spalax (Ukrainian blind mole-rat), *Allactaga major* (great jerboa), *Sicista subtilis* (southern birch mouse), *Ellobius talpinus* (northern mole-vole), *Lagurus* and *Eolagurus* (steppe lemming), *Microtus (Stenocranius) gregalis* (narrow-skulled vole), and *Microtus obscurus* ("obscurus" vole) (Markova 2000b).

In the Caucasus during the Last Interglacial, environments were warm and humid in the areas below 1,000 m asl, with deciduous and frequent exotic arboreal species reflecting a tropical to sub-tropical climate (Golovanova and Doronichev 2003:76). In the higher areas, the climate was also warmer than the present-day and forests were dominated by mixed coniferous firs (Golovanova and Doronichev 2003:79).

The Eastern European part of the Great European Plain saw the expansion of woodland and forest, further north than at present. First, it was colonized by *Betula* (birch), quickly followed by *pinus* (pine). During the temperate phase of the Last Interglacial, *Ulmus* (elm), then *Quercus* (oak) rapidly became the dominant forms of deciduous taxa, which were then mainly replaced by *Corylus* (hazel). The late-temperate stage of the Last Interglacial in this area was characterized by the swift spread of *Carpinus betulus* (hornbeam), which soon dominated the landscape, although *Alnus* (alder), *Quercus* (oak), *Albies* (silver fir), *Fraxinus* (ash), *Taxus* (yew), and other temperate trees remained in the forest spectra (Turner 2000: 223; Bolikhovskaya and Molodkov 2002). The gradual cooling at the end of the Last Interglacial resulted in the formation of boreal forest, heaths, and bogs. In general, the rapid expansion of all of these taxa during the Last Interglacial indicates that there were no short-lived climatic oscillations during this period, but rather there was only a continual warming (Turner 2000). This enabled the speedy migration northward of thermophilous flora and fauna, including humans, from their more southerly habitats and refugia. Large mammal fauna on the East European Plain included *Mammuthus primigenius* (mammoth), *Palaeoxodon antiquus* (forest elephant), *Coelodonta antiquitatis* (woolly rhinoceros), *Bison priscus* (steppe bison), and *Bos trochoceros* (aurochs) (Markova 2000b).

Early Glacial and Early Pleniglacial

During the Early Glacial and Early Pleniglacial, the post-Karangat (pre-Surozh) regression caused the Black Sea to drop 100–110 m below its present day level (Chepalyga 1984). This resulted in a dry shelf from the mouth of the Dniester to Crimea, where deflation and loess sedimentation was rampant. The northern bank of the Black Sea was 250–300 km south of the present-day mouths of the Dniester, Dnieper, and Don (Dodonova 2000). The Caspian Sea shrank, the Azov Sea disappeared, and the Northern Caucasus was joined to an enlarged northern Black Sea Plain that included Crimea (Alekseev et al. 1986).

Further north, the Scandinavian ice sheet expanded, covering the land adjacent to the Barents and Baltic Seas. While it did not cover nearly as large an area as it did during the Penultimate Glacial, the climate of Eastern Europe became significantly colder and drier. During the climatic oscillations of the OIS 5d–5a interval, open vegetation and forest conditions alternated. In response to the extension of the Scandinavian ice sheet during OIS 4, polar desert appeared at the sheet's margins. South of this, tundra and cold-arid steppe expanded, at the expense of thermophilous vegetation throughout the area, even in refugia (van Andel and Tzedakis 1996:491).

In Crimea during this period, neither fauna nor flora reflect such harsh climatic conditions, as boreal flora and fauna were uncommon (Gerasimenko 1999, 2003; Markova 1999; Mikhailesku 1999). The small mammal community of Crimea was typical of open, arid steppe, including *Eolagurus luteus, Spermophilus pygmaeus,* and *Microtus obscurus* (Markova 1999). Many of these were also present in the Last Interglacial community, indicating that there was only a moderate change toward more open and drier environments during this period. The pollen of OIS 4 indicates a sharp drop in broad leaved taxa, corresponding to a sharp increase in non-arboreal pollen. *Pinus* and *Alnus* mainly lead the arboreal taxa, while non-arboreal taxa include the xerophytic Chenopodiaceae (goosefoot, thistle), *Artemisia* (sagebrush), and *Ephedra* (ephedra) (Gerasimenko 1999:124).

Middle Pleniglacial

During most of the Middle Pleniglacial (from Moershoofd to Arcy), there was a significant rise in the Black Sea sea level during the Surozh transgression, to what was probably equivalent to its present-day size (Chepalyga 1984:234). The Azov Sea most likely did not exist at this time (Alekseev et al. 1986: 172–176). Instead, the Don River Valley extended into the area (Alekseev et al. 1986:172), and the northeastern-flowing Crimean rivers became tributaries of the Don. Due to the warming climate and the resultant increased evaporation, the Caspian Sea shrank considerably (Yenotayevka regression), with strandlines 45–60 m lower than today (Chepalyga 1984).

Middle Pleniglacial environments differed considerably by region but, in general, they were not as harsh as during the Early Pleniglacial. In Crimea, no boreal flora or fauna are found for this period (Gerasimenko 2003). Crimean landscapes were characterized by forms of forest-steppe/steppe, with mainly pine as the arboreal vegetation. In the Prut-Dniester, pine was also important in forest-steppe and steppe landscapes, although boreal forms such as spruce were common (Bolikhovskaya and Pashkevich 1982; Pashkevich 1987; Păunescu 1993). The reconstruction of forest-steppe and steppe environment for Crimea and the Prut-Dniester region is supported by faunal remains, including *Saiga tatarica, Equus hydruntinus, Equus caballus, Mammuthus primigenius,* with only rare *Cervus elaphus* and *Rangifer tarandus* (Alekseeva 1987; López Bayón 1998; Burke 1999a; Patou-Mathis 1999; Patou-Mathis, Chapter 22; Laroulandie and d'Errico, Chapter 7). According to Alekseeva (1987:160), the presence of reindeer in a Dniester Valley site might be explained by its fall/winter migration from more northerly habitats.

The environment of the Mid Don region during the Middle Pleniglacial was quite distinct from those contemporary environments in Crimea and in the Prut-Dniester regions. During the first part of the Middle Pleniglacial, the area had humid forest vegetation of northern taiga type, dominated by spruce, along with birch and pine (Malyasova and Spiridonova 1982:237–238). By the Arcy (Bryansk) Interstadial, this boreal forest was somewhat drier and of southern type, dominated by birch and pine with an overall decrease in arboreal pollen (Malyasova and Spiridonova 1982: 241–245). Markova et al. (2002:394) have reported that the taiga communities during the Bryansk were discontinuously distributed, forming "islands," and were also present in protected areas in the Russian Plain highlands. The fauna was dominated by *Equus latipes* and *Lepus tanaiticus*, which were adapted to the taiga forest-steppe and forest biotopes (Vereshchagin and Kuzmina 1982:227). At the onset of the Late Pleniglacial, the taiga forests were replaced by open forest-steppe and steppes (Malyasova and Spiridonova 1982:245).

To the north of the Mid Don region, the numerous warming events during this period saw the northward expansion of conifer woodland, while north of 55°N latitude, shrub tundra prevailed, characterized by *Betula nana* (dwarf birch), *Salix* (willow), and *Juniperus* (juniper) (Van Andel and Tzedakis 1996). In the Northern Caucasus, meadow steppes and mixed coniferous forests gave way during the Denekamp to deciduous forests with rare exotic arboreal species (Golovanova and Doronichev 2003).

The Eastern European Middle and Early Upper Paleolithic in Time and Space

Regional chronological syntheses for Eastern Europe (Kolesnik 1994; Chabai et al. 1998, 1999; Sytnyk 2000; Golovanova and Hoffecker 2000) have reported that: (1) no known Middle Paleolithic assemblage can be dated before the Last Interglacial (Boguckyj et al. 2001; Chabai in press); (2) the latest manifestation of the Middle Paleolithic occurred during the Denekamp (Arcy) Interstadial (Monigal, Chapter 1); and (3) from about 38,000 to 28,000 BP, Middle and Early Upper Paleolithic industries co-existed (Chabai 1996, Chabai et al. 1998).

The chronological and geographical distribution of Middle Paleolithic and Early Upper Paleolithic assemblages in Eastern Europe share some commonalities but also exhibit regional differences. There are only two regions, the Prut-Dniester and Crimea, that contain evidence for more or less continuous occupation from the Last Interglacial to the Denekamp (Arcy) Interstadial (Tables 25-1 and 25-4). In the Volga and Donbass-Azov regions, only early Middle Paleolithic is known, presumably dating to the Last Interglacial, Early Glacial, and Early Pleniglacial, while in the Northern Caucasus the known Middle Paleolithic dates only to the Middle Pleniglacial (Tables 25-2 and 25-3). There are no certain Early Upper Paleolithic sites known in the regions of the Volga and Donbass-Azov, or in the Northern Caucasus, for that matter. Only in Crimea, the Prut-Dniester, and the Mid Don regions are unequivocal Early Upper Paleolithic assemblages known.

There are three Middle Paleolithic entities defined for Eastern Europe: the Micoquian, a Levallois-Mousterian, and a Blade Mousterian (Chabai 2003). The only one found throughout Eastern Europe is the Micoquian: it extended from the Prut-Dniester region in the west, to the Volga region in the east, and from Crimea in the south to the Northern Urals in the north. In spite of its wide distribution, only in Crimea, where it lasted from the Last Interglacial to the Arcy Interstadial, does it appear to have had such a long continuous presence (Table 25-1). The Levallois-Mousterian has been found in two regions, the Prut-Dniester, where it lasted from the Last Interglacial through the Moershoofd, and Crimea, where it occurred in two periods: from the stadial preceding the Hengelo through the Hengelo and during the latter part of Würm III through the Denekamp (Arcy). The Blade Mousterian has been found only in the Don Basin, where it lasted from roughly the Brörup to OIS 4.

There are five entities defined for the earlier part of the Upper Paleolithic in Eastern Europe: the Streletskaya, Spitsynskaya, Gorodtsovskaya, Aurignacian, and the Early Gravettian. The Aurignacian was the most widespread of these, with unquestionable in situ sites in Crimea, the Prut-Dniester, and the Mid Don, and lasted roughly from 33 to 24,000 years BP. The Streletskaya was limited to the Don and Crimea, and appears to have lasted from 36 to 28,000 years BP. The Spitsynskaya is known only from the Mid Don and dates to between 36 and 32,000 years BP. Likewise, the Gorodtsovskaya is only known from the Mid Don, where it dates to between 28 and 25,000 years BP. The Early Gravettian was restricted to the Prut-Dniester and Mid Don and first appeared ca. 28,000 years BP.

Based on chronostratigraphic data from throughout Eastern Europe, the Middle and Early Upper Paleolithic may be divided into three temporal units (Chabai 2003): a 1st Period dating from the Last Interglacial through the Moershoofd Interstadial, (i.e., Riss/Würm to Würm I/II); a 2nd Period including the Hengelo Interstadial and the previous stadial (i.e., from Würm II to Würm II/III); and a 3rd Period including Denekamp (Arcy) Interstadial and the preceding stadial (i.e., Würm III–Würm III/IV).

The 1st Period (Last Interglacial through the Moershoofd Interstadial)

The 1st period, approximately spanning 125,000 to 60,000 years ago, saw the appearance of the Micoquian, Levallois-Mousterian, and Blade Mousterian in the various regions of Eastern Europe, often simultaneously in multiple locations. Crimea and the Prut-Dniester have an especially high number of occupations during this time in comparison to the other areas (Figures 25-3 and 25-4).

Crimea

During the 1st Period in Crimea, with the exception of the problematic assemblage from Starosele level 3, the Micoquian was the only Middle Paleolithic known (Table 25-1). Taking into account the probable geographic isolation of Crimea during the Last Interglacial (Lazukov et al. 1981), it is possible to divide this period into two stages: the Last Interglacial

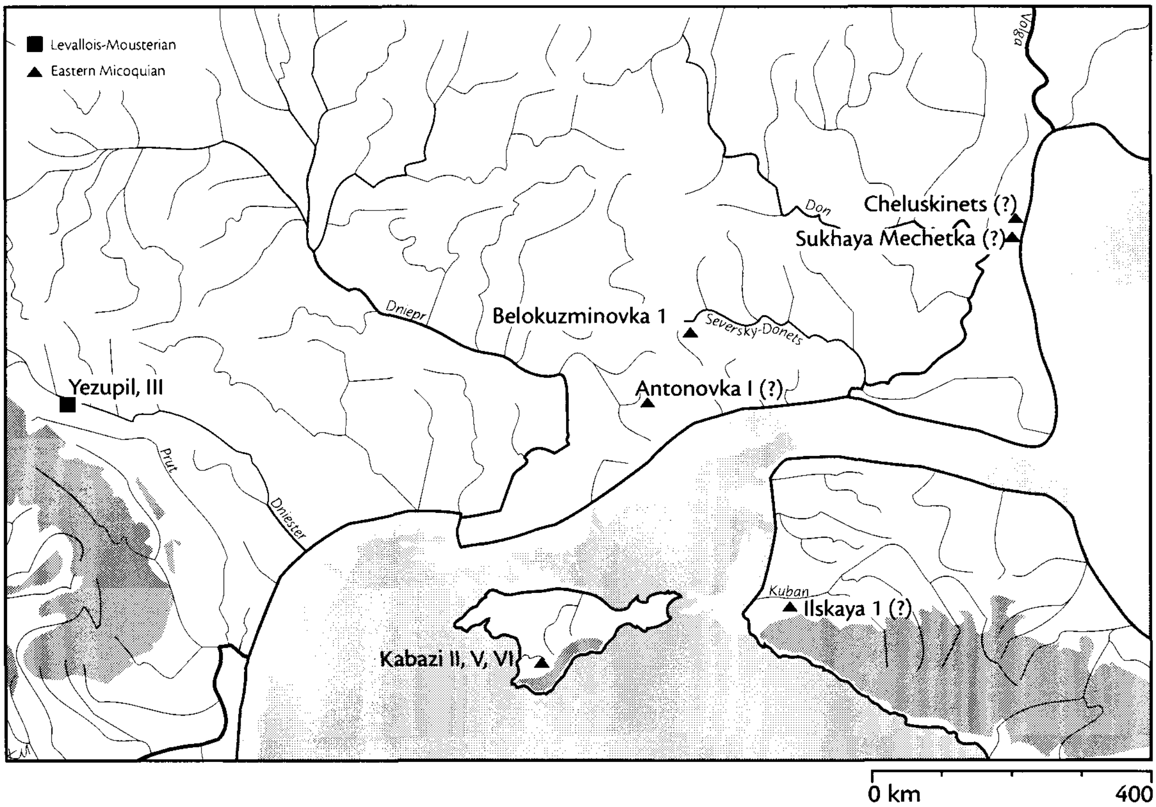

Figure 25-3—Sites of the Last Interglacial stage of the 1st Period of the Eastern European Middle Paleolithic.

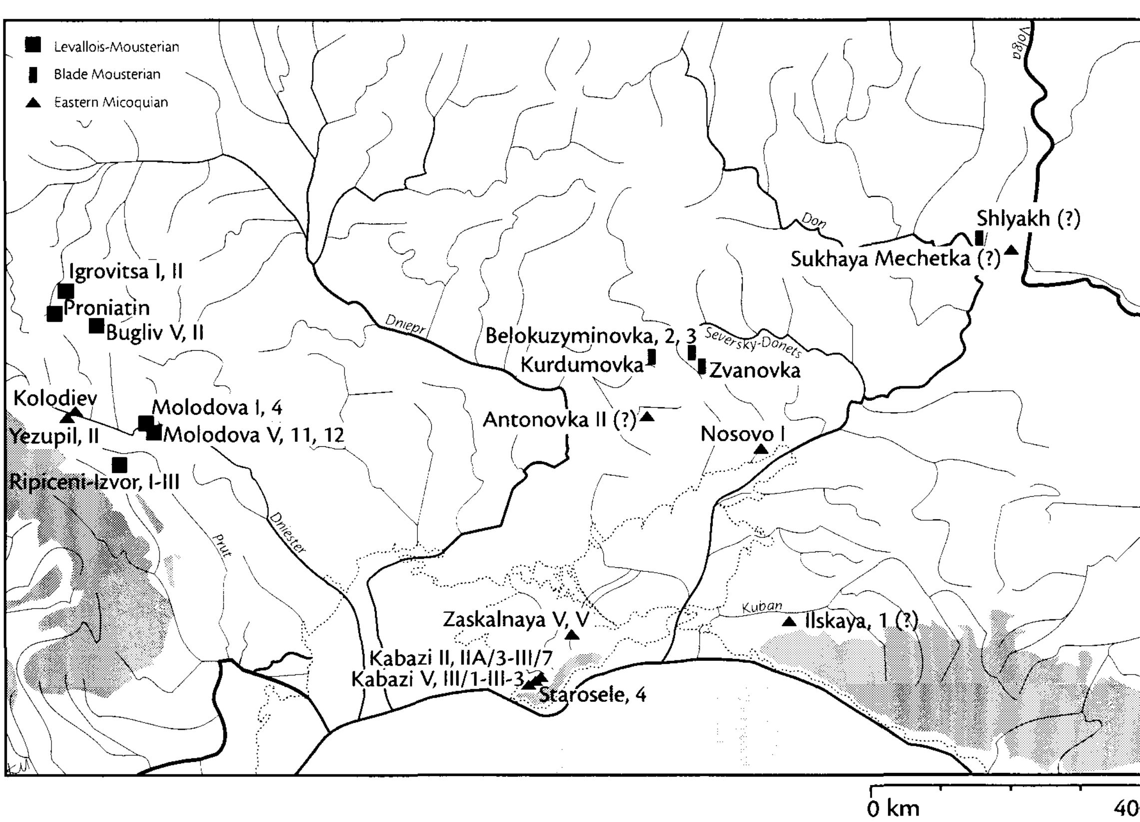

Figure 25-4—Sites of the Early Glacial–Moershoofd stages of the 1st Period of the Eastern European Middle Paleolithic.

TABLE 25-1
Chronology of the Crimean Middle Paleolithic and Early Upper Paleolithic (shaded areas are warm periods)

Industries	*Sites*	*Dates* *Radiocarbon*	*ESR*	*U-series*	*Geochronology*
Aurignacian	Siuren I, Fb2	OxA-5155 29.95±0.7			Arcy (Denekamp)
	Siuren I, Ga	OxA-5154 28.45±0.6			
	Siuren I, H	OxA-8249 28.2±0.44			
Micoquian	Buran-Kaya III, B	OxA-6674 28.52±0.46			
		OxA-6673 28.84±0.46			
	Zaskalnaya VI, II	OxA-4131 30.11±0.63			
	Prolom I, upper layer	GrA-13917 30.51±0.58/0.53			
		GrA-13919 31.3±0.63/0.58			
	Zaskalnaya V, I				
Western Crimean Mousterian	Kabazi II, A3A-A4				
	Kabazi II, II/1A		30±0.2		Stadial +
	Kabazi II, II/1	OxA-4770 31.55±0.6			Les Cottés
Streletskaya	Buran-Kaya III, C	OxA-6672 32.35±0.7			
		OxA-6869 32.2±0.65			
		OxA-6868 36.7±1.5			
Western Crimean Mousterian	Kabazi II, II/2	OxA-4771 35.1±0.6			
	Kabazi II, II/3				
	Kabazi II, II/4	OxA-4858 32.2±0.9			
	Kabazi II, II/5	OxA-4859 33.4±1			
	Kabazi II, II/6-II/7				
	Kabazi II, II/7AB		36±3		
			38±4		
	Kabazi II, II/7C-II/7E				
Micoquian	Zaskalnaya VI, III	OxA-4772 35.25±0.9			
	Zaskalnaya VI, IIIa	OxA-4132 30.76±0.69			
		OxA-4773 39.1±1.5			
	Zaskalnaya V, II		41.8±3.1		
	Starosele, 1	OxA-4775 41.2±1.8	41.2±3.6		Hengelo
		OxA-4887 42.5±3.6			
	Starosele, 2			about 45	
Western Crimean Mousterian	Kabazi II, II/8			44±5	
	Kabazi II, IIA/1-II/8C				
	Kabazi II, IIA/2				Stadial
Micoquian	Zaskalnaya V, III				
	Zaskalnaya V, IV	GrA-13916 >46			
	Chokurcha I, IV	OxA-10877 >45.4			
	Kabazi II, IIA/3-IIA/4B				Moershoofd
	Kabazi V, II/3-II/4A				
Starosele Level 3	Starosele, 3			about 67.5	Stadial
Micoquian	Kabazi V, III/1-III/3			73.4±6	
	Kabazi II, III/1A; III/1				
	Zaskalnaya V, V				Odderade
	Starosele, 4		77±6	about 80	Brörup
	Kabazi II, III/2		74-85		Amersfoort
	Kabazi II, III/2A				Stadial
	Kabazi II, III/3		82±10		
	Kabazi II, III/4-III/7				
	Kabazi II, V/3-VI/17				Last Interglacial

TABLE 25-2
Middle Paleolithic chronology of the Northern Caucasus (shaded areas are warm periods)

Industries	*Site*	*Dates*		*Geochronology*
		Radiocarbon	*U-series*	
Micoquian	Mezmaiskaya, 2	ЛЕ-4735 32.23±0.74		Stadial (Würm III)
	Mezmaiskaya, 2A	Beta-53896/CAMS-2999 35.76±0.4 Beta-53897/ETH-9817 36.28±0.54		
	Matuzka, 4B-C	ЛУ-3692 34.2±1.41		
	Mezmaiskaya, 2B-1, 2, 2B-3			Stadial (Würm II)
	Mezmaiskaya, 2B-4	ЛЕ-3599 40.66±1.6		
	Mezmaiskaya, 3	ЛЕ-3841 >45		
	Monasheskaya, 2-4			
	Barakaevskaya, 3			
	Ilskaya	??? 37.2±1.8; ??? 40.8±1.2	47±2 135±2.5	???

(Riss/Würm) and the Early Glacial (Early Würm). The Last Interglacial Micoquian is only known from Kabazi II (Chabai in press).

A number of other Crimean assemblages have been attributed to a Last Interglacial age. The suggestion that the "Kiik-Koba lower layer type industry" is, in fact, "Eastern Taubachian" was made by V. N. Stepanchuk (1994a, 1994b) on the basis of heavily rounded and naturally broken artifacts from redeposited Last Interglacial alluvium at Kabazi II Unit IV (Chabai in press). At Kiik-Koba, the lower layer does contain a large number of denticulated and notched artifacts, but this assemblage is not dated and has little relationship to either the Taubachian or the Last Interglacial (Chabai et al. 2000:10). Other finds attributed to a "Crimean Taubachian" come from surface collections at Krasnyi Mak 1 and 2 and an undated assemblage from Zalesnoye (Stepanchuk 1994a, 1994b). The last might not even be of Pleistocene age. Thus, as in Central Europe, the purported Taubachian of Last Interglacial has yet to be documented in Crimea.

Northern Caucasus

In the Northern Caucasus, there is only one probable site of Last Interglacial age: Ilskaya I. Liubine (1994: 157) referred to this site as "the talk of the town, the subject of quite contradictory opinions and evaluations." The best example of Liubine's characterization is an article where its authors twice established the age of Ilskaya I: the first time as Early Würm–Würm I/II, and then, some pages later, as Riss/Würm (Golovanova and Hoffecker 2000:37, 61). The latter postulated Riss/Würm age of Ilskaya I is supported by one of the soils and by the presence of warm adapted insects found in bitumen puddles (Praslov and Muratov 1970; Praslov 1984a). The stratigraphic correlation between the bitumen puddles and the artifacts is not clear, however, and there are no absolute dates for Ilskaya I that correspond to the commonly accepted age of the Last Interglacial (Table 25-2).

The stratigraphic sequence at Ilskaya II, situated near Ilskaya I, shows the complex character of the Pleistocene depositional processes of the Kuban River terraces (Schelinskij 1998). At the same time, the stratigraphic correlation of Ilskaya I with II is still an open question.

Donbass-Azov

Chronological controls in the Donbass-Azov region are based only on geological and pollen interpretations (Gerasimenko and Kolesnik 1989, 1992; Gerasimenko 1993, 2003; Kolesnik 1993). There are neither absolute dates nor faunal assemblages. The archeological record is quite incomplete for the period: there are no in situ Middle Paleolithic occupations dated to after the Early Pleniglacial and there is no evidence, at all, for any Early Upper Paleolithic. Almost all Middle Paleolithic occupations, both Micoquian and Blade Mousterian (Kolesnik 1994), are in derived contexts, having been found in redeposited colluvial sediments or in layers disturbed by colluviation. Thus, the interpretation of the local Middle Paleolithic chronology poses a number of problems. The known sequence is limited to the 1st Period—from the Last Interglacial through the Early Pleniglacial.

The main archeological sequence occurs at Belokuzminovka (Table 25-3) and contains the remains of three archeological occupations, including Micoquian and Blade Mousterian, which, according to the pollen analysis, are datable from the Last Interglacial (Kaydaky soil) to the Early Pleniglacial (Uday loess). The middle layer at Belokuzminovka corresponds to the Early Glacial (Pryluky, b2 soil). The Pryluky, b2 soil in the Novotroitsky quarry south of Donetsk was dated by TL to 102/103,000 BP (89Д-Geo-TL) (Gerasimenko 2003).

TABLE 25-3
Middle Paleolithic chronology of the Donbass-Azov region

Industries	*Sites*	*Geochronology*
Blade Mousterian	Belokuzminovka, 3	Early Pleniglacial
	Zvanovka	
	Belokuzminovka, 2	Early Glacial
	Kurdumovka	
Micoquian	Nosovo I	
	Antonovka II (?)	
	Antonovka I (?)	Last Interglacial
	Belokuzminovka, 1	

At Kurdumovka, artifacts were found in both the Uday loess and Pryluky, b2 soil. Kolesnik initially suggested that the artifacts were deposited in the Pryluky, b2 soil and then redeposited during "Uday times" (Kolesnik 2000:67). At Nosovo I and Rozhok I, artifacts were recovered from loess that overlies a Last Interglacial soil (Praslov 1968, 1984a:32; Schelinski 1999). At Zvanovka, there is a clear association of an archeological occupation and the Uday loess. There are two more sites: Antonovka I and II. The geo-chronological position of the redeposited layers at Antonovka I and II (Table 25-3) were defined a long time ago (Gladilin 1969) based on the geological description of available profiles but has never been supported by additional evidence.

Mid Don

In the Mid Don region, the stratigraphic sequence of the Middle Paleolithic site of Shlyakh consists of nine Upper Pleistocene layers. Artifacts were found in layer 8, which underlies a pronounced soil in layer 7. According to pollen analyses, environmental conditions during the sedimentation of layer 8 were milder than in layer 7. The investigators of Shlyakh suggest that the artifact-bearing layer 8 was formed "in the early or middle parts of the Upper Pleistocene" (Nehoroshev and Vishnyatsky 2000:259). There are three radiocarbon dates for this layer: >26,000 (ЛЕ-5522), 46,300 ± 310 (OxA-8306), and 45,700 ± 300 BP (OxA-8307). Obviously, the age of this occupation is very close to the limits of radiocarbon dating. Thus, taking into account the available radiometric chronology and environmental studies, it is possible to suggest that Shlyakh layer 8 might have been deposited during either the Moershoofd Interstadial or the following stadial. If not actually falling into the 1st Period, it dates very close to its end.

Volga

In the Volga region, there are two important Middle Paleolithic localities in the Lower Volga basin: Sukhaya Metchetka and Cheluskinets. Neither can be placed securely in a chronological position, but it is clear that both fall into the 1st Period. There are two main points of view on the Sukhaya Mechetka chronology. Praslov (1984a) and Kuznetsova (1985) think that the single occupation of Sukhaya Metchetka comes from a Last Interglacial soil. Grischenko (1965) and Velichko (1988), on the other hand, argue for an Early Glacial age of this locality. Pollen data support the later point of view (Chiguryaeva and Khvalina 1961). In addition, a Last Interglacial age for the Cheluskinets artifact assemblage is problematic. Most of the artifacts were found near the studied section, but not in the soil of supposed Last Interglacial age (Kuznetsova and Sergin 1999:103). Also, only one of four TL dates corresponds broadly to the commonly accepted age of the Last Interglacial, making it doubtful that any of them are good: (84,000 ± 9,000, 145,000 ± 18,000, > 160,000, and >215,000 BP).

Prut-Dniester

In the Prut-Dniester region, the earliest well-documented manifestation of Middle Paleolithic is found in Yezupil layer III (Sytnyk 2000; Boguckyj et al. 2001). This layer is in the "horizon A2 of the Gorohiv soil complex," which consists of two soil horizons with solifluction above them (Sytnyk 2000:253, 316). The Gorohiv soil complex is associated with the Last Interglacial and has been TL dated at other localities from 96,000 ± 1000 to 133,000 ± 1500 (Shelkoplias and Christoforova 1991), while, presumably, the solifluction reflects climatic oscillations during the following stadial and the Amersfoort Interstadial. In spite of the clear stratigraphic position of Yezupil layer III's artifact and fauna assemblages, its TL date of 155,000 ± 1100 does not correspond well to the commonly adopted chronological limits of the Last Interglacial (Table 25-4). The faunal remains, *Bos* and *Bison*, do not support—but do not contradict—a Last Interglacial date for the layer. At the same time, there are no arctic/boreal species, which are common for the faunal complexes from the soliflucted part of Gorohiv soil complex (Sytnyk 2000:318, Table 24). Weighing these various lines of evidence, it appears that Yezupil layer III most likely dates to the Last Interglacial.

Table 25-4

Chronology of the Middle Paleolithic and Early Upper Paleolithic of the Prut-Dniester river basins (shaded areas are warm periods)

Industries	*Sites*	*Dates* *Radiocarbon*	*TL*	*Geochronology*
???	Ripiceni-Izvor, "Aurignacian" Ib	Bln-809 28.4±0.4		Denekamp (Arcy)
Gravettian	Molodova V, 8	ЛУ-14 >24.6		
	Molodova V, 9	ЛУ-15a 29.65±1.32		
		ЛУ-15б 28.1±1		
	Mitoc Malul Galben, 7b	GrN-13006 23.07±0.18		
		OxA-2033 24.8±0.43		
		GrN-14913 25.33±0.42		
	Mitoc Malul Galben, 7b mid	GrN-18815 26.5±0.46/0.44		
		GrN-18880 26.02±0.65/0.6		
		GrN-18881 26.38±0.6/0.5		
		GrN-18879 26.3±0.45/0.43		
		GrN-18882 25.08±0.5/0.47		
		GrN-18883 26.11±1.05/0.93		
	Mitoc Malul Galben, 7b	OxA-1778 27.5±0.6		
		GrN-12636 28.91±0.48		
Gravettian / Aurignacian	Mitoc Malul Galben, 8b	GrN-15453 27.1±1.5		
		GrN-14914 27.41±0.43		
		GrN-12637 31.85±0.8		
Aurignacian	Mitoc Malul Galben, 9b	GrN-13007 >24		
		GrN-15451 26.53±0.4		
		GrN-14037 26.91±0.45		
		GrN-15454 29.41±0.31		
		GrA-1355 25.38±0.12		
	Mitoc Malul Galben, 10b	GrN-15456 25.93±0.45		
		GrA-1648 31±0.33		
	Mitoc Malul Galben, 11 sup.	GrN-15457 24.4±2.2/1.7		
		GrN-20443 30.24±0.47/0.44		
		GrN-20700 31.16±0.57/0.53		
	Mitoc Malul Galben, 11 sup.,hearth	OxA-1646 31.1±0.9		
	Mitoc Malul Galben, 11 inf.	GrN-20442 30.92±0.39		
	Mitoc Malul Galben, 12a	GrN-20444 31.16±0.55/0.51		
	Mitoc Malul Galben, 12b	GrA-1357 32.73±0.22		
Micoquian	Ripiceni-Izvor, "Mousterian" IV			Stadial
	Ripiceni-Izvor, "Mousterian" V			Hengelo
	Ripiceni-Izvor, "Mousterian" VI	GrN-9210 40.2±1.1/1		Stadial
		GrN-9209 42.5±1.3/1.1		
		GrN-9207 43.8±1.1/1		
		GrN-9208 44.8±1.3/1.1		
Levallois-Mousterian	Ripiceni-Izvor, "Mousterian" III	GrN-11571 45±1.4/1.2		Moershoofd
		GrN-11230 46.4±4.7/2.9		
		GrN-14367 46.2±1.1		
	Molodova V, 11a	ЛГ-16 >35.0		
	Ripiceni-Izvor, "Mousterian" II			Odderade
	Molodova V, 11b			
	Molodova I, 4	GrN-3659 >44.0		Stadial
	Molodova V, 11	??? >40.3		Brörup (end)
	Molodova V, 12	ЛГ-17 >45.6		Brörup (?)
	Ripiceni-Izvor, "Mousterian" I			Amersfoort + Brörup
	Proniatin		85±7	Amersfoort+Stadial
Micoquian	Kolodiev, depth 12.5-12.9 m			
	Yezupil, II		100±7	
Levallois-Mousterian	Igrovitsa I, II		135±9	
	Bugliv V, II		140±12	
	Yezupil, III		155±11	Last Interglacial

There are a number of other assemblages that appear to be coeval with the soliflucted part of the Gorohiv soil (stadial + Amersfoort): Bugliv V layer II, Igrovitsa I layer II, Yezupil layer II; Kolodiev depth 12.5–12.9 m, and Proniatin. Some of these locations produced arcto-boreal species, such as reindeer, polar fox, and lemming (Sytnyk 2000: 144, 317-318). Two of the four available TL dates (Yezupil II and Proniatin) more or less fit into the commonly accepted age of the Early Pleniglacial Interstadials (Table 25-4). Correlations among these Dniester-Prut sites are tentative, however, because of different geo-chronological schemes used in the region. Sites in the upper Dniester, including Bugliv V, Igrovitsa I, Yezupil, Kolodiev, and Proniatin, were described by A. Bogutskij using his own Upper Pleistocene systematics (Bogutskij et al. 1997). Sites from the mid Dniester (Molodova) and Prut (Ripiceni-Izvor and Mitoc Malul Galben), however, were described using North European terms (Ivanova 1982, 1987; Păunescu 1993; Damblon et al. 1996; Damblon 1997; Damblon and Haesaerts 1997).

There are, in addition, some basic differences in the stratigraphic successions among sections in the Prut, the Upper Dniester, and the Mid Dniester Valleys. The Gorohiv soil complex, found in the Upper Dniester and thought to date to the Last Interglacial–Amersfoort interval, has no analogies in the Mid Dniester and Prut areas. On the other hand, there is no geological equivalent in the Prut and the Upper Dniester to the ashy horizon (Moershoofd) found in the Mid Dniester. The thick and monotonous "Upper Pleistocene loess" found in the Upper Dniester has no analogies in either the Mid Dniester or the Prut Valleys. Thus, in spite of the small size of the Prut-Dniester region, there are no regional geological benchmarks present at these Upper Pleistocene localities.

The continuation of the chronological and stratigraphic sequence of the Upper Dniester is seen at locations in the Mid Dniester and Prut valleys: Ripiceni-Izvor, Molodova I, and Molodova V (Table 25-4). Based on geological and bio-stratigraphical data, an Amersfoort/Brörup/Odderade age for the "Mousterian" layers I and II from Ripiceni-Izvor was proposed (Păunescu 1993). The proposed Moershoofd date for Ripiceni-Izvor layer III was based not only on bio-stratigraphic evidence, but also on radiocarbon dates (Table 25-4). Taking into account that the commonly accepted age for the Moershoofd Interstadial is beyond the limits of radiocarbon chronology, this series of dates is more or less acceptable. Less successful was an attempt to date the Middle Paleolithic occupations at Molodova I and V by radiocarbon (Table 25-4). At the same time, the chronological position of the Molodova occupations was established on the basis of extensive environmental studies (Ivanova 1982, 1987). The earliest Middle Paleolithic occupations at Molodova correspond to the Brörup Interstadial, while the end of Molodova Middle Paleolithic sequence corresponds to the Moershoofd Interstadial.

In the Molodova sites, the relatively thick ashy layer of the Moershoofd deposits, which has been found at a number of other Mid Dniester localities, may be considered a temporal and industrial benchmark. This Moershoofd ashy layer is the upper stratigraphic limit for the Middle Paleolithic occupations at the Molodova sites, as well as the upper chronological boundary for all of the Levallois-Mousterian assemblages in the whole Dniester-Prut region. That is, all assemblages of this early Middle Paleolithic period (or 1st Period) in the Dniester-Prut region are Levallois-Mousterian (Chernysh 1982, 1987; Păunescu 1993; Sytnyk 2000), with the exception of the Micoquian at Yezupil layer II and Kolodiev depth 12.5–12.9 m (Sytnyk 2000).

In sum, while there are only a few sites clearly attributable to the Last Interglacial, they are found throughout Eastern Europe. Without question, there is an increase of known sites datable to the Early Glacial and even more to the Early Pleniglacial. To some extent, this may reflect differences in extant, exposed geological sediments of different ages, but it is likely to also reflect an increase in the number of sites and, perhaps, some increase in Eastern European population size. Even with relatively few sites, by the Late Interglacial, there were two different archeological industries/complexes present in Eastern Europe: the Micoquian, which was widespread, and the Levallois-Mousterian, which was limited to a single occurrence in the Upper Dniester. Between the end of the Last Interglacial and the end of the Moershoofd, a third lithic industry, the Blade Mousterian, appears in the Donbass region.

The 2nd Period (Post-Moershoofd Stadial through the Hengelo Interstadial)

The 2nd period correlates with the Western European Würm II through Würm II/III. It is relatively short, compared with the previous period, from ca. 55,000 BP to 38,000 BP. In spite of the shorter duration, more in situ sites are known from all regions, with the exception of the Donbass and the Lower Volga (Figure 25-5). There are, as well, more absolute dates to aid in interregional correlations. The Micoquian continues in many areas during this period, while the Levallois-Mousterian makes its initial appearance in the south. There are no known Blade Mousterian assemblages that date to this period.

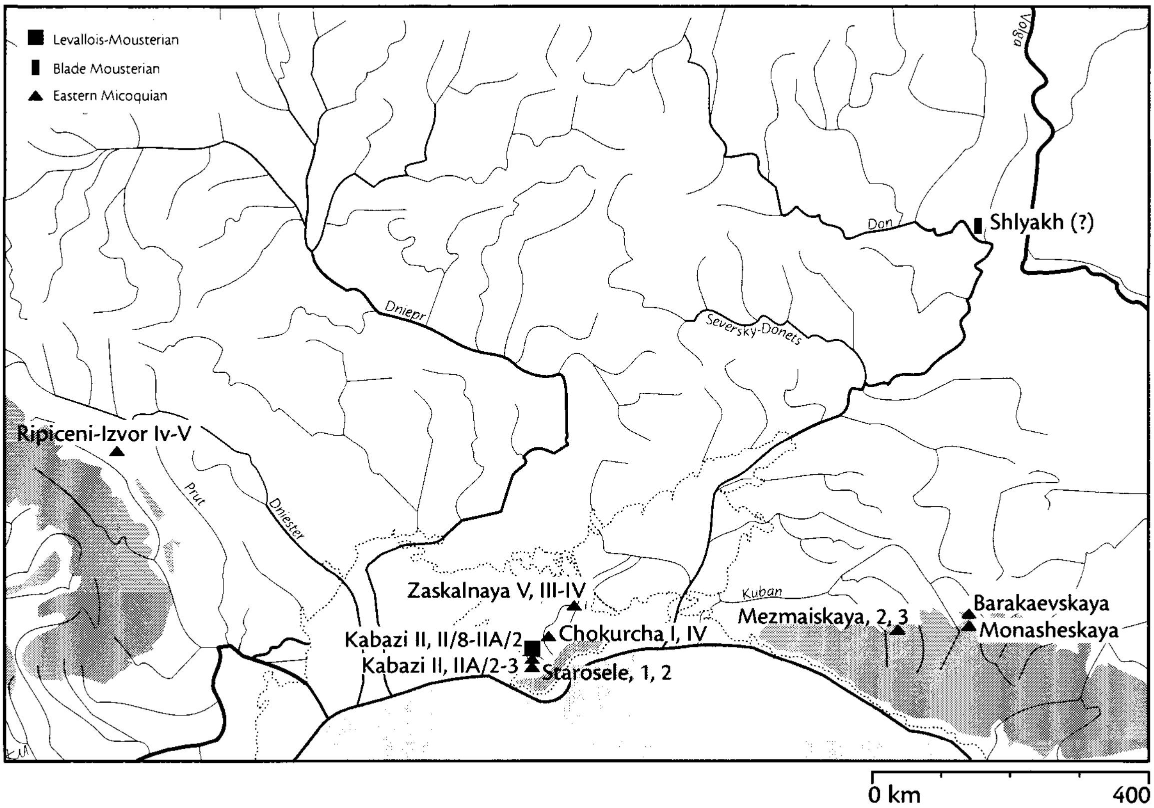

Figure 25-5—Sites of the 2nd Period of the Eastern European Middle Paleolithic.

Crimea

In Crimea, the Western Crimean Mousterian (part of the Levallois-Mousterian) appears during the 2nd Period, while the Micoquian continues (Table 25-1). Assemblages dating to this period have been found at Kabazi II levels IIA/1-II/8, Starosele levels 1 and probably 2, Zaskalnaya V layers III and IV, Chokurcha I unit IV, and Karabi Tamchin levels 2, 3, 4 (Table 25-1). The Western Crimean Mousterian always overlies Micoquian assemblages where they are found stratified together. At the same time, some Micoquian assemblages, as those from Zaskalnaya V layers III and IV, contain some typical Western Crimean Mousterian tools and cores, which has been interpreted as a mechanical mixture of Western Crimean Mousterian (Levallois-Mousterian) and Micoquian occupations (Chabai 2000a).

The small assemblage from Buran-Kaya III level E, stratigraphically overlain by at least one Middle Paleolithic assemblage (the Micoquian of Layer B) and dating to some time before 36,000 BP, is a problem. Its blade technology is clearly Upper Paleolithic but the few tools recovered are non-diagnostic (Monigal, Chapter 4). If it were Upper Paleolithic, it would represent the earliest evidence for such in Crimea and, in fact, in all of Eastern Europe.

Northern Caucasus

In the Northern Caucasus, there are three sites that fall into the 2nd Period: Barakaevskaya layer 3, Monasheskaya level 2-4, and Mezmaiskaya levels 2B-1 through 3, all of which contain Micoquian assemblages. Radiometric dates are only available for Mezmaiskaya levels 2B-4 and 3 (Table 25-2). The dating of the other sites is based on the similarity of their bio-stratigraphical sequences to the well-studied sediments of Barakaevskaya Cave. These extensive multidisciplinary studies suggest that the artifact-bearing layer 3 of Barakaevskaya Cave dates to Würm II (Liubine, ed. 1994). Based on environmental similarities, E. V. Belyaeva proposed that Barakaevskaya layer 3 and Monasheskaya layer 2-4 were contemporaneous and belong to OIS stage 3 (Belyaeva 1999:70, 152, 154).

The temporal interpretation of the Mezmaiskaya sequence made by L. Golovanova and J. Hoffecker is in disagreement with the radiometric dates and the environmental studies of this location. The lowest archeologically sterile layers, 5 and 4, belong to a period of climatic warming. Forest-dwelling microfauna were found in layer 5 and forest soil was identified in layer 4. Layer 3, with a radiocarbon date of >45,000 BP, contains forest and alpine meadow rodents. The pollen spectrum of layer 2B-4 (dated to 40,660 ± 160 BP) is dominated by grasses and bushes, while the arboreal composition is poor and xerophytic. The uppermost layers, 2A and 2, (ca. 36–32,000 BP) exhibit about the same environmental conditions seen in layers 2B-4 and 3. That is, after the relatively mild conditions of layers 5 and 4, there was a shift to a relatively cold and arid environment in layers 3 through 2. Thus, it is not clear why Golovanova and Hoffecker suggested layers 3 and 2B-4 date to the interstadial conditions of Würm I/II (Moershoofd) but, at the same time, suggested that layer 2B-4 could also be dated to Würm II (stadial) (Golovanova and Hoffecker 2000: 37). This last suggestion is more in agreement with radiocarbon chronology and environmental studies.

Prut-Dniester

In the Prut-Dniester region a clear Micoquian has been found at Ripiceni-Izvor layers IV to V (Păunescu 1993), the temporal position of which was established by bio-stratigraphical studies and radiocarbon dates (Table 25-4). Recently, these assemblages have been referred to as "Eastern Micoquian" (Yevtushenko 1998c, 1999).

In sum, the Micoquian is well represented during the 2nd Period. The Levallois-Mousterian is present only as the Western Crimean Mousterian in Crimea, having disappeared from the Prut-Dniester region. In addition, there is a hint of a very early Upper Paleolithic in Crimea. There are no stratified Middle Paleolithic sites in Northern Ukraine or in the Polesye region, although there are two localities with redeposited artifacts: Richta and Zitomirskaya (Smirnov 1979; Kukharchuk 1989; Kukharchuk and Mesiats 1991). The absence of Middle Paleolithic materials from the Donbass, Lower Volga, and the Mid Don regions, particularly during the stadial preceding Hengelo, may well reflect the extremely cold and dry conditions that pertained in those areas.

The 3rd Period (Post-Hengelo Stadial through the Denekamp Interstadial)

In absolute time, the 3rd Period ranges from ca. 38,000 BP until somewhat less than 28–27,000 BP. It also includes a number of different Middle Paleolithic and Early Upper Paleolithic industries: Micoquian, Levallois-Mousterian, Gorodtsovskaya, Spitsynskaya, Streletskaya, Aurignacian, and Gravettian. These appear discontinuously in time and space, with only Crimea and the Prut-Dniester region showing continuous occupation from the previous period through the 3rd Period (Table 25-1). There appears to have been no occupation of the Donbass-Azov region during this period (Figures 25-6 and 25-7).

Crimea

In Crimea, this period is remarkable for an early appearance of a clear Upper Paleolithic assemblage, coeval with Western Crimean Mousterian and Micoquian occupations. Upper Paleolithic assemblages are known from Buran-Kaya III level C (stadial) and Siuren I units F, G, and H (Denekamp/Arcy Interstadial) (Table 25-1). Middle Paleolithic assemblages that continued during the stadial and Denekamp (Arcy) are known from Kabazi II levels A3A–II/7E, Zaskalnaya V layers I and II, Zaskalnaya VI layers II–IIIA, Prolom I upper level, and Buran-Kaya III layer B. The coexistence of the Middle and Upper Paleolithic in Crimea is documented by microfaunal and palynological studies, radiocarbon chronology (Table 25-1), and stratigraphy. At Buran-Kaya III, an Early Upper Paleolithic assemblage from level C underlies the Middle Paleolithic from layer B (Monigal, Chapters 1, 5; Demidenko, Chapter 9). At Siuren I, in units G and H, the Middle Paleolithic artifacts recovered from numerous Aurignacian levels have been interpreted by Demidenko (2000) as the result of mechanical mixture of Middle Paleolithic and Aurignacian occupations.

Northern Caucasus

In the Northern Caucasus, the Middle Paleolithic occupation at Matuzka layer 4C (radiocarbon dated to 34,200 ± 141 BP) took place within a high altitude forest environment. It is not clear why Golovanova and Hoffecker (2000) have ascribed this layer to Würm II/III (Hengelo). This interpretation contradicts the radiocarbon date (Table 25-2), and the environmental definition "high altitude forest" does not help much to establish a temporal position, because there is no regional environmental framework for the Upper Pleistocene of the Northern Caucasus. The comparison of the environmental characteristics identified in Matuzka layer 4C with those of Mezmaiskaya and Barakaevskaya is highly problematic because the latter is undated and because the three sites vary greatly in their altitude. The sites only contain Micoquian assemblages. The radiocarbon dates for Mezmaiskaya layers 2A and 2 do overlap with that from Matuzka layer 4C (Table 25-2), indicating that these three occupations date to ca. 36–32,000 BP.

Mid Don

In the Mid Don region, assemblages belonging to the 3rd Period have been found in numerous open-air localities around the villages of Kostenki and Borshchevo in the Don Valley. These assemblages all belong to the Early Upper Paleolithic Streletskaya, Spitsynskaya, Gorodtsovskaya, Aurignacian, and Gravettian industries (Tables 25-5, 25-6).

There are three benchmark geological events in Kostenki-Borshchevo that are usually used in chrono-

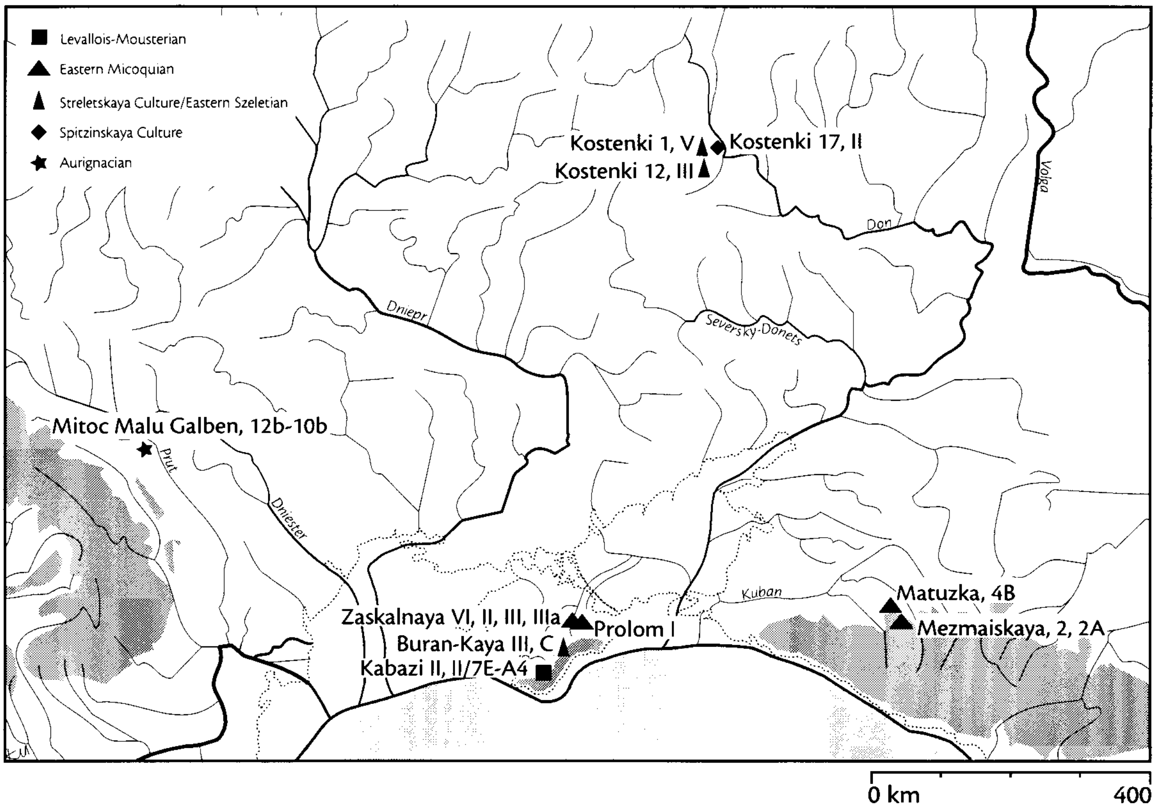

Figure 25-6—Sites of the Early Stage of the 3rd (Transitional) Period of the Eastern European Paleolithic.

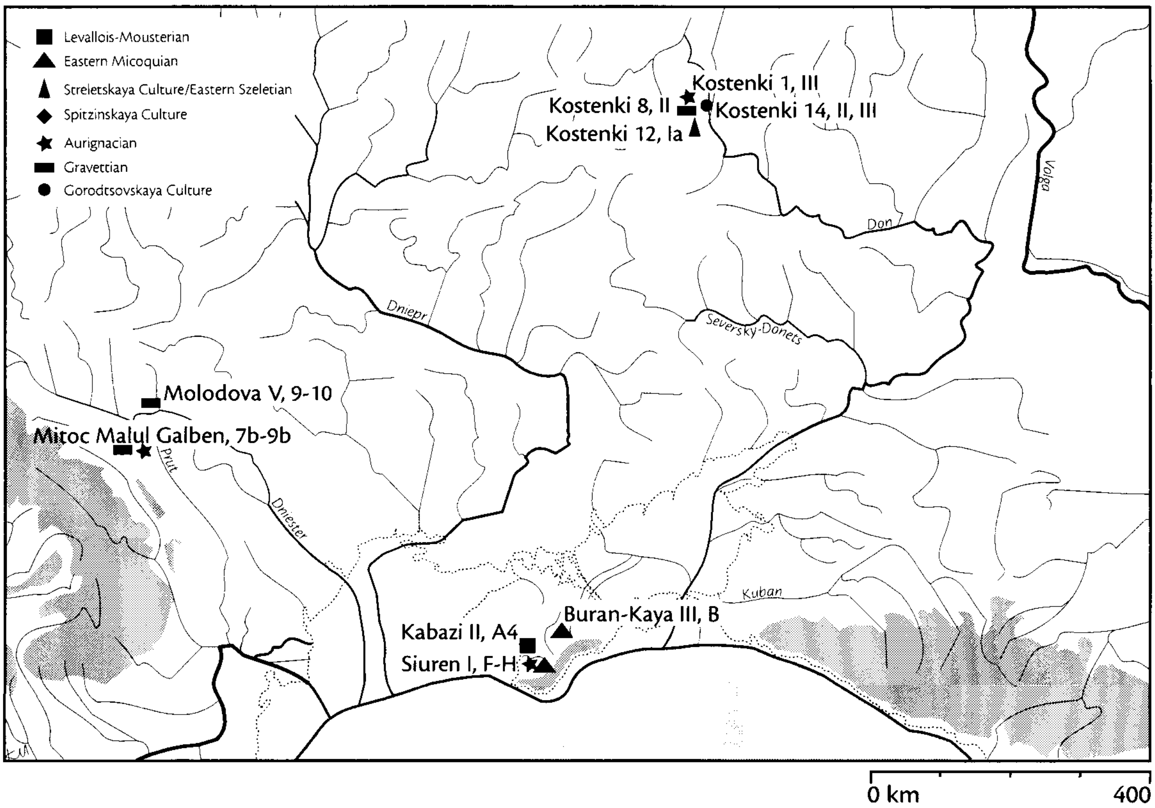

Figure 25-7—Sites of the Late Stage of the 3rd (Transitional) Period of the Eastern European Paleolithic.

Table 25-5
Early Upper Paleolithic chronology of the Mid Don river valley: Kostenki Ancient Chronological Group

Industries	*Site*	*Radiocarbon dates*	*Stratigraphy*
Streletskaya	Kostenki 1, V	ГИН-6247 >18800	Lower Humic Bed
		ЛЕ-2030 27.39±0.3	
		ЛЕ-3542 30.17±0.57	
		GrA-5557 32.3±0.22	
		GrA-5245 34.9±0.35	
		GrA-5245 37.9±2.8/2.1	
	Kostenki 6	ГИН-8023 21.1±0.2	redeposited Lower Humic Bed
		ГИН-8572 31.2±0.5	
	Kostenki 12, III	ГИН-8021 >31	Lower Humic Bed
		GrA-5551 36.28±0.36/0.35	
Upper Paleolithic	Kostenki 14, IV	OxA-4116 27.46±0.39	
		OxA-4117 27.71±0.41	
	Kostenki 14, IVa	ЛЕ-5271 27.4±5.5	
		ГИН-8025 29.7±0.4	
		GrN-22277 33.28±0.65/0.6	
		GrA-13301 33.2±0.51/0.48	
		GrA-13297 34.55±0.61/0.56	
	Kostenki 14, IVb	??? 34.94±0.63/0.59	
		GrA-10948 37.24±0.43/0.4	
Spitsynskaya	Kostenki 17, II	ЛЕ-1436 32.78±0.3	
		GrN-10512 32.2±2/1.6	
		GrN-12596 36.78±1.7/1.4	

logical and stratigraphic studies: the Lower and Upper Humic Beds and the layer of volcanic ash in between. The Lower Humic Bed dates to 36–32,000 BP, the volcanic ash layer to 38–33,000 BP, and the Upper Humic Bed to 32–27,000 BP (Sinitsyn et al. 1997:27–29). The archeological occupations from the Lower Humic Bed have been combined into an "Ancient Chronological Group," while those from the Upper Humic Bed have been combined into a "Middle Chronological Group." The Lower Humic Bed has been correlated with the Hengelo Interstadial, while the Upper Humic Bed with the Denekamp (Arcy) Interstadial (Rogachev and Anikovich 1984:166; Sinitsyn et al. 1997:28). Such correlations are not supported by palynological investigations, however, which show that both Humic Beds reflect harsh environmental conditions (Malyasova and Spiridonova 1982). Sinitsyn has likewise noted that there is no basis for correlating either of the Humic Beds to warm interstadial conditions (Sinitsyn et al. 1997:26).

The "Ancient Chronological Group" includes the following assemblages: Kostenki 1 layer V, Kostenki 6, Kostenki 8 layer IV, Kostenki 11 layer V, Kostenki 12 layers II and III, Kostenki 14 layers IV, IVa, and IVb, and Kostenki 17 layer II (Sinitsyn et al. 1997: 27; Sinitsyn 2000). There are no radiometric dates for Kostenki 8 layer IV, Kostenki 11 layer V, Kostenki 12 layer II. The artifacts and bones from Kostenki 6 were in derived position (Rogachev and Anikovich 1982b: 90) and its dates contradict the postulated age of the "Ancient Chronological Group" (Table 25-5, Figure 25-8). Even more of a problem is the stratigraphy of Kostenki 11 layer V: the scant archeological material of that layer was found in a silty level overlain by the Upper Humic Bed and underlain by a thin humic lens (Rogachev and Popov 1982: 130). While this silty level is claimed to be of Lower Humic Bed age, it has not been reported at other Kostenki sites and it is not clear whether the thin humic lens underlying it is also part of the Lower Humic Bed. In fact, the silty level may be a local, stratigraphically intrusive deposit *within* the Upper Humic Bed. The absence of absolute dating for this sediment makes it impossible to know its real age. On the other hand, the stratigraphic and chronological positions (Table 25-5) of Kostenki 1 layer V, Kostenki 12 layer III, Kostenki 14 layers IV, IVa, and IVb, and Kostenki 17 layer II appear to be well grounded (Lazukov 1982:23; Sinitsyn et al. 1997:51).

The assemblages from Kostenki 1 layer V and Kostenki 12 layer III belong to the "Streletskaya culture," while that from Kostenki 17 layer II belongs to the "Spitsynskaya culture." Rogachev and Anikovich (1982c:138) additionally include the Kostenki 12 layer II assemblage as Spitsynskaya. If this is so, then the

TABLE 25-6
The Early Upper Paleolithic chronology of the Mid Don river valley: Kostenki Middle Chronological Group

Industries	*Sites*	*Radiocarbon*	*Stratigraphy*
Aurignacian	Kostenki 1, III	ГИН-4848 20.9±1.6	above Upper Humic Bed
		ГИН-2942 >22	
		ГИН-4850 24.5±1.3	
		ГИН-6248 25.4±0.4	
		ГИН-4852 25.6±0.1	
		ГИН-4902 25.7±0.6	
		ЛЕ-3541 25.73±1.8	
		ГИН-4849 25.9±2.2	
		GrN-22276 25.82±0.4	
		ГИН-4885 26.2±1.5	
		GrN-17117 32.6±0.4	
		OxA-7073 32.6±1.1	
		AA-5590 38.08±5.46/3.2	
Telmanskaya (Gravettoid)	Kostenki 8	OxA-7109 23.02±0.32	Upper Humic Bed
		ГИН-7999 24.5±0.45	
		GrN-10509 27.7±0.45	
Gorodtsovskaya / Streletskaya	Kostenki 12, I-Ia	TA-154 20.9±0.39	
		ЛУ-1749 24.42±0.31	
		ЛУ-1821 29.03±0.56	
Gorodtsovskaya	Kostenki 12, I	ГИН-89 23.6±0.3	
		ГИН-8019 24±0.8	
		ГИН-8574 26.3±0.3	
Streletskaya	Kostenki 12, Ia	GrN-5552 28.5±0.14	
		ЛЕ-1428a 28.7±0.4	
		ЛЕ-1428б 30.24±0.4	
		ЛЕ-1428в 31.15±0.15	
		ЛЕ-1428г 31.9±0.2	
		GrN-7758 32.7±0.7	
Gorodtsovskaya	Kostenki 14, II	ЛЕ-1400 19.3±0.2	
		the same in ЛУ 25.09±0.31	
		ГИН-8030 25.6±0.4	
		ЛУ-59a 26.4±0.66	
		ЛУ-59б 28.2±0.7	
		GrN-12598 28.38±0.22	
		OxA-4115 28.58±0.42	
	Kostenki 14, II-III	AA-4798 14.355±0.12	
		GrN-10510 15.26±0.26	
	Kostenki 14, III	ГИН-79 14.3±0.46	
		GrN-21802 30.08±0.59/0.55	
	Kostenki 16	ЛЕ-1431 25.1±0.15	
		ЛЕ-5270 27.4±0.1	
		ГИН-8033 26.8±0.6	
		ГИН-8031 28.2±0.5	
Spitsynskaya ?	Kostenki 17, I	ГИН-8076 21.1±0.6	
		ГИН-8074 23±0.8	
		ГИН-8075 24.3±0.5	
		GrN-10511 26.75±0.7	
Gorodtsovskaya	Kostenki 15	ЛЕ-1430 21.72±0.57	below Upper Humic Bed
		ГИН-8020 25.7±0.25	

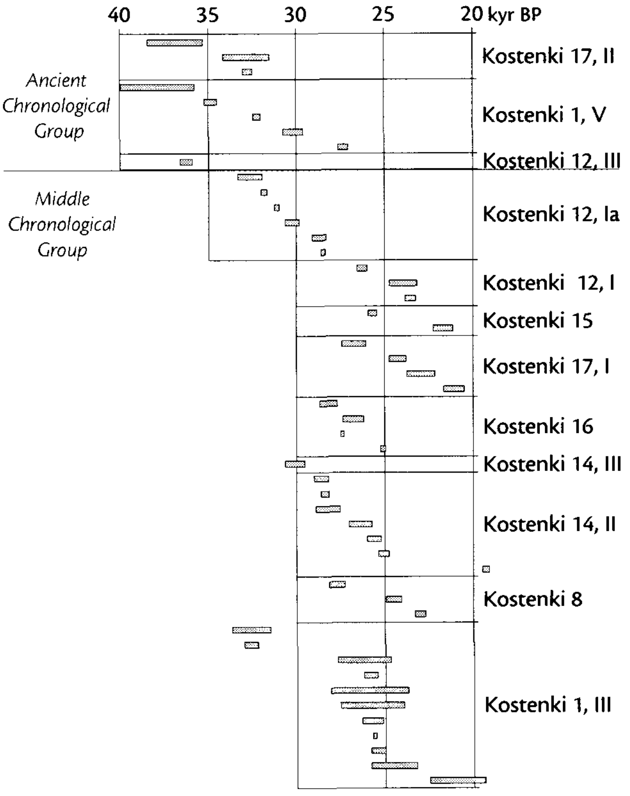

Figure 25-8—Distribution of radiocarbon dates (one standard deviation) for the Kostenki Ancient and Middle Chronological Groups.

Kostenki 12 sequence shows a stratigraphic correlation between Streletskaya (layer III) and Spitsynskaya (layer II) assemblages. Unfortunately, only a few Upper Paleolithic artifacts have been recovered from Kostenki 8 layer IV and Kostenki 14 layers IV, IVa, and IVb and these have not been attributed to any particular "culture" (Sinitsyn 2000).

The Middle Chronological Group consists of following assemblages: Kostenki 1 layer III, Kostenki 5 layer III, Kostenki 8 layers II and III, Kostenki 11 layer IV, Kostenki 12 layers I and Ia, Kostenki 14 layers II and III, Kostenki 15, Kostenki 16, Kostenki 17 layer I, and Borshchevo 3 and 4 (Sinitsyn et al. 1997: 28). A number of these assemblages do not comfortably fit the stratigraphic and chronological definitions of the Middle Chronological Group (Figure 25-3). The small, undated artifact assemblage of Kostenki 11 layer IV, for instance, was found "in the base of brown silt and humic lenses" (Rogachev and Popov 1982:130) and its connection to the Upper Humic Bed is not clear. Also undated and clearly redeposited are the artifacts from Kostenki 5 layer III (Rogachev and Anikovich 1982a:87). The correlation of the Upper Humic Bed with the "*middle part of the brown loess-like silt*" of the Aurignacian occupation of Kostenki 1 layer III is questionable (Rogachev et al. 1982: 62). According to G. I. Lazukov (1982: 23), layer IV but not layer III occurred in the Upper Humic Bed at Kostenki 1. Ten of 13 radiocarbon dates for Kostenki 1 layer III contradict the assumed age of the Middle Chronological Group, while 7 of 13 dates place the age of this assemblage at ca. 25,000 BP (Table 25-6). Thus, taking into account Lazukov's description of Kostenki 1 layer III's stratigraphic position and the range of radiocarbon dates, it is likely that this assemblage post-dates the age of the Middle Chronological Group. The dates for Kostenki 8 layer II, Kostenki 12 layers I and Ia, Kostenki 14 layers II and III also appear to be younger than assumed age of the Middle Chronological Group (Table 25-6). The artifacts of Kostenki 15 were found in the lower part of Upper Humic Bed and in the underlying silt (Rogachev and Sinitsyn 1982b:162). Thus, stratigraphically it was thought to be the oldest assemblage of the Middle Chronological Group, but this is contradicted by the available radiocarbon dates (Table 25-6). The stratigraphic position of Kostenki 17 layer I, in the upper part of the Upper Humic Bed, is likewise contradicted by the dates (Table 25-6). Unfortunately, the information now available for Borshchevo 3 and 4, said to be of this period, does not permit any judgments concerning their stratigraphy, chronology, or industrial attribution (Rogachev 1982a, 1982b; Sinitsyn et al. 1997:28).

The large number of sites at Kostenki, the various permutations of the sedimentary sequences, the different "archeological cultures," and the large number of often discordant radiocarbon dates, suggests that additional work will modify the present Middle Chronological Group, both as to the number of sites and their chronology.

Prut-Dniester

In the Prut-Dniester region, the 3rd period saw the continuation of the Micoquian at Ripiceni-Izvor during the stadial preceding Denekamp (Arcy) (Table 25-4). The Upper Paleolithic appears during the Denekamp (Arcy) Interstadial: Aurignacian and Gravettian from Mitoc Malul Galben and Molodova V layers 8-10 (Table 25-4). In the lower part of Mitoc sequence (cycles 13 to 8), incipient soils are related to brief warm periods, while in the upper part of the sequence (cycles 7–1), they are mostly tundra-gley and associated with permafrost (Damblon and Haesaerts 1997:266). The three Aurignacian occupations at Mitoc Malul Galben were in the lower cycles 12-8, and date to between 33–27. The four Gravettian occupations in the upper cycles 7–2 date to between 27 to 23,000 BP (Damblon and Haesaerts 1997:266). There are more than 60 radiocarbon dates from the 14 m of deposits at Mitoc Malul Galben, and their interpretation in connection with the stratigraphic and lithic analyses has resulted in some confusion (Damblon et al. 1996;

Damblon and Haesaerts 1997; Otte 1997). Borziac and Kulakovskaya (1998:55), for example, have proposed an earlier date for the Gravettian sedimentary cycles of 29–25,000 BP, based on some technological and typological similarities between the Mitoc Gravettian of sedimentary cycle 7 and Molodova V layers 9 and 8. The dates for the lower part of the Gravettian sequence (cycle 7b) permits either interpretation. At the same time, the radiocarbon dates for Molodova V have sufficiently large standard deviations (Table 25-4) that they might be interpreted as younger than 29,000 BP. Furthermore, the sedimentary cycles containing Gravettian assemblages are of tundra-gley type, which is associated with permafrost (Damblon et al. 1996). It is unlikely that this kind of sediment formed about 29,000 BP during interstadial conditions.

In sum, during the 3rd Period, there were a great number of sites in most of the regions of Eastern Europe representing a diverse set of lithic industries. Despite the fact that many more dates are available for this period than there were for the previous periods, as well as many stratigraphically sound sites, the exact chronology and interaction, if any, between these Late Middle Paleolithic and Early Upper Paleolithic peoples is still very much unanswerable. There are, furthermore, a number of other sites and specific, localized "cultures" that have been purported to belong to the 3rd Period. They will be given a brief mention here because so many are widely cited, but all are, to the authors, without solid foundation.

The attribution of the Northern Caucasus assemblage of Mezmaiskaya layer 1C to the Levantine Ahmarian (Golovanova 2000:175), as well as its chronological position (ca. 32,000 BP), are very curious. This assemblage contains numerous backed bladelets and micro-blades that are not like those of the Levantine Ahmarian (Gilead 1981; Marks 1981; Coinman 1998). Also, in spite of a noted depositional break between the lowermost Middle Paleolithic layer 2 and the "Ahmarian" layer 1C, the radiocarbon dates are identical: 32,230 ± 740 BP and 32,010 ± 250 BP (Golovanova 2000:166, 172).

The open-air site of Sungir, situated on the northwestern tributary of the Volga, is often cited as an example of a Late Streletskaya occupation or even as a specific "Sungirian" industry. The primary flaking was based on "prismatic" blade cores. The toolkit consists of bifacial Streletskaya-type points, "Mousterian forms," endscrapers, burins, and backed bladelets. Bone artifacts and adornments are numerous and variable (Bader 1978). Rogachev and Anikovich (1984: 180) noted, however, the absence of characteristic Streletskaya endscrapers and that the abundant burins and backed bladelets are uncommon in the Streletskaya, as was blade core reduction, bone artifacts, and adornments. On the other hand, all of these are characteristic of the Gravettian. The single "cultural layer" at Sungir was significantly disturbed by frost action and solifluction and radiocarbon dates have a considerable range: from 19,790 ± 800 to 25,500 ± 200 BP (Svezhentsev 1993). The Sungirian burials were recently directly dated to 23–24,000 BP (Pettitt and Bader 2000). Thus, it is most likely that the "Sungirian" contains a mixture of Streletskaya and Gravettian assemblages and should not be considered culturally homogeneous.

The Brynzeny "culture" from the Dniester-Prut region is both chronologically and typologically suspect. It is often used as an example of "Szeletian influence" in the Moldova area (e.g., Chirica and Borziac 1996:167). At the same time, the oldest date for this "culture" is only 26,000 ± 300 BP (OxA-4122) obtained from Brynzeny, layer 3. That date is too young to relate to the Szeletian in Central Europe but is consistent with local Gravettian dates. The co-occurrence of bifacial bi-convex leaf points, bifacial plano-convex scrapers, and thick endscrapers, along with backed bladelets and micro-blades is most parsimoniously explained as a mechanical mixture of Micoquian, Szeletian, Aurignacian, and Gravettian materials. This "Szeletian" appears to be the easternmost known at this time, and the Central European Szeletian seems to have had a little influence on Eastern European developments.

There is little information about the stratigraphy and chronology at Kulichivka in the Polesye region (Savich 1975), which is reported to contain both Bohunician (Demidenko and Usik 1993a, 1993b) and Gravettian assemblages. The date 31,000 BP, without lab number, is often cited for the Bohunician level, but appears to be too young for this kind of assemblage. Information about the typological structure of the Kulichivka assemblages is not available. Likewise, although they are frequently cited, the stratigraphical sequences and typological characteristics of such "transitional" assemblages as Zhornov (Polesye) and Mira (Mid Dnieper) are known only from preliminary publications (Piasetski 1991, 1992; Stepanchuk et al. 1998).

The cultural attribution to the "Aurignacian-related Prut culture" of assemblages at Gordineshti, Korpach Mys, Korpachi layer 4, and Ripiceni-Izvor layers 1a, 1b, 2a, and 2b is highly questionable (Borziac and Chetraru 1996). The only available date, from Korpachi layer 4, is 25,250±3000 BP (GrN-9758). The Aurignacian elements in Ripiceni-Izvor are few (Aurignacian index = 3.29), its Gravettian diagnostics are dubious, and half of the tool assemblage consists of notches and denticulates (Păunescu 1993:137–138).

The longest and most detailed chronological and stratigraphic sequences are found in Crimea and the Prut-Dniester Basins (Tables 25-1 and 25-4). Both regions include all periods of the Middle and Early Upper Paleolithic known in Eastern Europe. The main difference between the Crimean and the Prut-Dniester sequences is that a more complex Early Upper Paleolithic succession is present in the Prut-Dniester, while a richer and more detailed Middle Paleolithic sequence is found in Crimea. Both the Donbass-Azov (Table 25-3) and Lower Volga Middle Paleolithic sequences are limited to the 1st Period, while there are no reliably dated locations of this period in the Northern Caucasus, at all. More or less well dated Northern Caucasus assemblages belong to the 2nd and 3rd Periods (Table 25-2). Middle Paleolithic occupations in the Mid Don Valley are datable to either the 1st or 2nd Periods, while the 3rd Period is represented by an incredible variety of Early Upper Paleolithic assemblages (Tables 25-5 and 25-6). At the same time, Middle Paleolithic assemblages belonging to the 3rd Period are also found in the Mid Don Valley, but are absent in adjacent regions.

If the chronological borders of the 1st and 2nd Periods do not have many problems, mainly due to the relatively small number of available radiometric dates, the chronological limits of the 3rd Period (Transitional) are less secure. The chronology of this period was defined on the basis of radiocarbon dates for the oldest Early Upper Paleolithic occurrences in the Mid Don Basin, on the one hand, and by the latest Middle Paleolithic assemblages in Crimea, on the other.

The radiocarbon chronology of the 3rd Period in Crimea is supported by bio-stratigraphic studies. It is chronologically limited to the stadial preceding the Denekamp (Arcy) Interstadial and the Denekamp (Arcy) itself. It is probably most reasonable to suggest a 30,000 BP border between the assemblages of the Ancient and Middle Chronological Groups of the Kostenki-Borshchevo Early Upper Paleolithic. The distribution of radiocarbon dates for these sites at one standard deviation shows that the majority of dates for the Middle Chronological Group are younger than 30,000 BP, while almost all dates for the Ancient Chronological Groups are older than 30,000 BP (Figure 25-8). In archeological terms, a 30,000 BP chronological border would correspond to the appearance of the Gorodtsovskaya in the Mid Don region. Also, after 30,000 BP, there is evidence for Aurignacian occupations in Crimea and Gravettian ones in the Prut-Dniester Basins. Thus, the chronological limits of the 3rd Period should be 38,000 to 28/27,000 BP. Within these limits, it is possible to propose two temporal divisions: an early stage from 38,000 BP to 30,000 BP and a late stage from 30,000 BP to 28/27,000 BP (Figure 25-18).

Archeological Variability

As in Western Europe, there is a considerable variety of both Middle and Upper Paleolithic industries defined for Eastern Europe. The Eastern European Middle Paleolithic may be viewed as including, at least, three quite distinct archeological groups, distinguished by technological and/or typological characteristics: the Micoquian, Levallois-Mousterian, and the Blade Mousterian (Chabai 2003). The Early Upper Paleolithic has even a larger number of differently named groups: the Streletskaya, Spitsynskaya, Gorodtsovskaya, Aurignacian, and the Early Gravettian, as well as at least two, unnamed Early Upper Paleolithic assemblages.

Not all named entities are comparable. The Eastern Micoquian, for instance, is known from many sites, spanning considerable time and space and might well be considered a complex. When grouped with the Micoquian from Central Europe, both its geographic range and its technological and typological variability increase markedly so, together, the Central and Eastern Micoquian (the Micoquian, *sensu lato*) might well be considered a technocomplex. On the other end of the spectrum, there is the Spitsynskaya, consisting of, at most, two assemblages clustered at a single locus, and dating to a very brief interval. At best, the Spitsynskaya might be considered an industry but one that is more hypothetical than documented.

The Eastern Micoquian Complex

For a long time, the Central European Micoquian was viewed as the standard for typological and chronological definitions of the Eastern European Micoquian (Gladilin 1985; Yevtushenko 1999). Yet, investigations in Bavaria, the Prâdnik Valley, and the Brno district demonstrated that the typological structure of the Central European Micoquian itself was very complex in each area and in Central Europe, as a whole (Kozłowski and Kozłowski 1977; Valoch 1988; Richter 1997, 1999; Conard and Fischer 2000). In spite of that internal variability, research also shows typological and technological similarities among some Eastern and Central European Micoquian assemblages (Kozłowski and Kozłowski 1977). Symmetric and asymmetric plano-convex bifacial tools (Figure 25-9: *1-4, 7, 8*) were recognized as a shared characteristic of the Micoquian in every area (Bosinski 1967; Chmielewski 1969; Kulakovskaya 1990; Kulakovskaya et al. 1993; Yevtushenko 1998c; Burdukiewicz 2000). In fact, the presence of these bifacial plano-convex tools and the specific method of their manufacture became the diagnostic criterion that differentiates the Micoquian from other Central and Eastern European Middle and Early Upper Paleolithic industries.

Within the Eastern European Micoquian technology and its ever-present, shared plano-convex method of bifacial tool production and its paucity of purposeful blade production, there is significant variability in typological structure (the proportional occurrences of different tool groups). Sometimes these typological differences seem to overwhelm the similarities. For instance, the typological structures of Ripiceni Izvor and Barakaevskaya are very different, as are those of Antonovka I and Gubs shelter #1. As isolated occurrences, these differences were even considered sufficient to place the assemblages into different "cultures." Yet, when viewed as part of the known, rather limited, variability of most Eastern Micoquian assemblages, they can be seen as merely the extremes within a cluster of varying typological structures. There are now a significant number of dated and published Crimean Micoquian assemblages, and they are used here to define chronological, technological, and typological variability found in the Eastern Micoquian of the Northern Caucasus, Lower Volga, Donbass-Azov, and Prut-Dniester regions.

Crimea

The Crimean Micoquian apparently fails to exhibit any typological or technological changes during the 100,000 years of its existence. Both chronologically early and late Micoquian assemblages are characterized by a dominance of the plano-convex method of bifacial tool production within the bifacial reduction, as well as flake blank production based on the reduction of cores without supplementary striking platforms or volumetric flaking surfaces (Chabai 1998d, in press). When blades occur, they are only the unintentional results of invasive reduction of the convex surfaces of plano-convex tools.

Differing ratios of simple (transverse, simple, and double scrapers), convergent (points and convergent scrapers), and bifacial tools (all types of bifacial tools) have been used to subdivide the Crimean Micoquian into three facies: Ak-Kaya, Starosele, and Kiik-Koba (Chabai and Marks 1998; Chabai et al. 1998). These facies are thought to reflect different patterns of economic activities and different adaptations to varying raw material availability (Chabai et al. 1995; Marks and Chabai 2001). The proportional variation in bifacial tools, relative to simple and converging tools, is truly marked, from very low to over one-third (Table 25-7).

Bifacial scrapers and points (Figure 25-9: *1, 4, 8*) have a variety of shapes, most often semi- and sub-leaf and semi- and sub-crescent. Backed bifacial scrapers, resembling Prondnik and Klausennische types occur mainly in the Ak-Kaya facies but occur in other facies, as well. The semi-leaf, sub-leaf, semi-crescent, sub-crescent, semi- trapezoidal, and sub-trapezoidal shapes (Figure 25-9: *6*) are dominant among points and convergent scrapers. Unifacial tools often have different kinds of ventral thinning that, while not truly bifacial, adds to the already marked tendency for modification of both blank faces.

Northern Caucasus

The core reduction strategy of Northern Caucasus assemblages is based on the use of parallel multi-platform, unsystematic, and radial cores (Belyaeva 1999; Golovanova and Hoffecker 2000). The distinctive features of the Micoquian assemblages, said to separate them from the other Middle Paleolithic industries of the Caucasus, are bifacial triangular and leaf-shaped points (Figure 25-9: *7*), bifacial scrapers, and "knives," resembling Bockstein, Klausennische, and Sukhaya Mechetka types (Golovanova and Hoffecker 2000: 38).

Bifacial tools vary from as low as 1% (Barakaevskaya and Monasheskaya) to a high of only 12.6 % (Mezmaiskaya layer 3), convergent tools vary from 14% to 53%, and simple tools from 16% to 45%. Different trapezoid (Figure 25-9: *5*) and crescent shapes occur among convergent scrapers. Only in Matuzka layer 4B-C do convergent tools outnumber simple tools. Thus, most Northern Caucasus Micoquian assemblages are characterized by low proportions of bifacial tools relative to simple and convergent tools. On this basis, the proposed typological similarity of some Northern Caucasus assemblages specifically with Prolom I (Liubine 1994:161), or with the Kiik-Koba facies, as a whole (Golovanova and Hoffecker 2000: 47), is without foundation. Rather, the Northern Caucasus Micoquian assemblages of Mezmaiskaya layers 2-2A, 2B-4, and 3, Barakaevskaya, and Gubs Shelter # 1, among others, can be linked with the Crimean Micoquian of Staroselian facies (Table 25-8).

Donbass-Azov

The Micoquian of the Donbass-Azov region is known from Antonovka I and II, Belokuzminovka level 1, Cherkasskoe, Nosovo I, and, probably, Rozhok I. The most typical assemblages were found at Antonovka I and II (Gladilin 1976).

The core reduction strategy at both Antonovka sites was based on the reduction of parallel and multi-platform cores. Bifacial tools range from 21% to 24% of all tools (Gladilin 1976:89) and most were made on flakes and called "semi-bifacial" by Gladilin.

Simple tools dominate the tool assemblage. Points are very rare and convergent scrapers include a variety of crescent, triangular, trapezoidal, and leaf shapes (Gladilin 1976: 71-76). Different kinds of ventral thinning were used in convergent scraper manufacture and

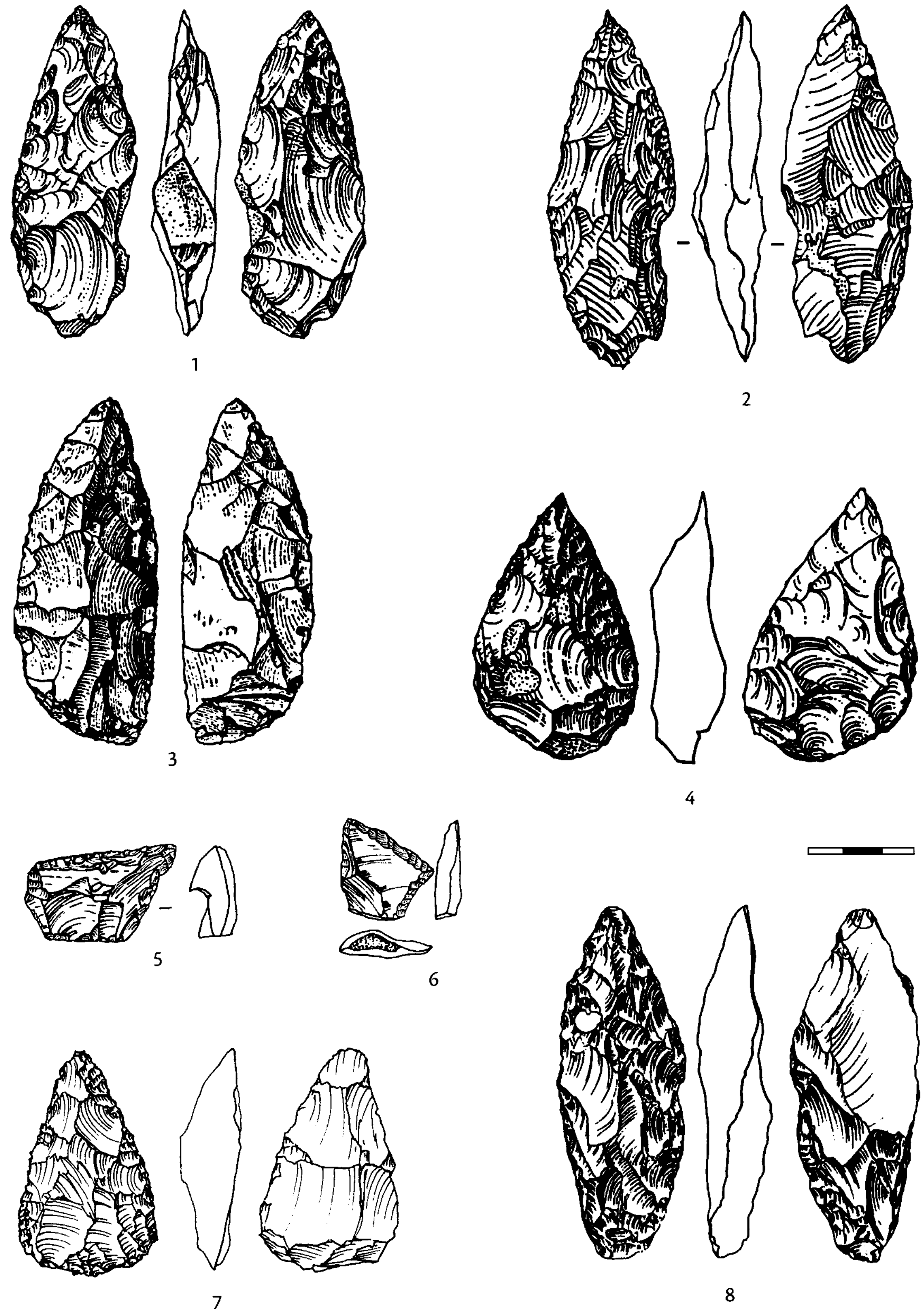

Figure 25-9—Eastern European Micoquian bifacial leaf-shaped points and scrapers (1–4, 7, 8) and sub-trapezoidal scrapers (5, 6) from Zaskalnaya V layer III (1, 4); Antonovka I (2); Ripiceni-Izvor, Mousterian layer IV (3); Mezmaiskaya layer 2A-2 (5); Buran-Kaya III layer B (6); Barakayevskaya (7); and Kabazi II level III/2 (8) (after Kolosov 1984; Gladilin 1976; Chabai 1998b; Golovanova and Hoffecker 2000).

TABLE 25-7
Facies of the Crimean Micoquian: ratios of simple, convergent, and bifacial tools

		Simple	*Convergent*	*Bifacial*
Ak-Kaya	Chokurcha I, IV-I	47.9	16.7	35.4
	Kabazi II, V-VI	31.4	25.5	43.1
	Zaskalnaya VI, II	37.8	32.1	30.1
	Chokurcha I, IV-M	30.3	39.4	30.3
	Zaskalnaya V, V	28.2	42.3	29.5
	Kabazi II, III	51.3	20.5	28.2
	Chokurcha I, IV	47.3	25.8	26.9
	Sary-Kaya, 1977	58.5	15.3	26.6
	Zaskalnaya V, II	49.9	26.2	23.9
	Zaskalnaya V, III	46.1	30.4	23.5
	Zaskalnaya V, VI	41.7	35.4	22.9
	Zaskalnaya VI, III	53.9	26.1	20.0
	Chokurcha I, IV-O	57.5	27.5	15.0
Starosele	Prolom II, III	48.3	34.8	16.9
	Zaskalnaya VI, V	37.9	45.4	16.7
	Zaskalnaya V, I	33.3	50.7	15.9
	Prolom II, II	43.6	42.6	13.8
	Zaskalnaya V, IV	39.9	47.7	12.4
	Zaskalnaya VI, IV	46.9	42.4	10.6
	Prolom II, IV	48.6	44.3	7.1
	Starosele, 1	44.3	43.4	12.3
	Kabazi V, C	48.1	38.9	13.3
	Kabazi V, D	44.6	42.1	12.2
Kiik-Koba	Prolom I, lower layer	27.8	54.1	18.1
	Prolom I, upper layer	30.9	55.3	13.7
	Kiik-Koba, upper layer	27.5	56.2	16.3
	Buran-Kaya III, 7-8	37.0	51.9	11.1
	Buran-Kaya III, B	38.0	51.2	10.8

rejuvenation. The shapes of bifacial tools (Figure 25-9: *2*) are about the same as for convergent scrapers. Tools resembling Bockstein and Klausennische knives were defined among the bifacial tools (Gladilin 1976:71).

On a whole, the Antonovka I and II assemblages are characterized by the dominance of simple tools (35.9% to 50%), very high proportions of bifacial tools (33.7% to 28.7 %), and moderate proportions of convergent tools (30.3% to 21.8%). This typological structure differs from that of the Northern Caucasus and Lower Volga Micoquian but falls with the range of the Ak-Kaya facies of the Crimean Micoquian (Table 25-8).

There are a few other Donbass-Azov sites that appear to be Micoquian, but their tool samples are poor and the reports preliminary, preventing their placement within the three Crimean facies. At Belokuzminovka layer 1, about 200 artifacts were recovered but few were retouched. The toolkit consists of transverse scrapers, one "asymmetric" point, denticulates, as well as bifacial crescent and ovoid scrapers (Kolesnik 1993:123). The tools found in Nosovo I include simple, diagonal, and *déjeté* scrapers, "crescent-shaped knives," bifacial backed knives, and triangular scrapers (Schelinskij 1999:123, 126-127).

Lower Volga

The most representative Micoquian assemblage in the Lower Volga Valley is from the open-air site of Sukhaya Mechetka. The core reduction strategies are based on the reduction of radial and "multi-platform parallel" cores. Bifacial tools account for 9% of the retouched tools, and all of them are plano-convex (Kuznetsova 1985:8-10).

The toolkit is dominated by unifacial simple lateral scrapers and transverse, diagonal, and double scrapers are common. There are symmetric and asymmetric points, many semi-trapezoidal scrapers, and the bifacial tools are mainly leaf-shaped and crescent. Kuznetsova (1985:10) also noted the presence of backed bifacial tools, typologically close to Klausennische knives.

The proportional occurrences of the three tool groups (convergent tools ca. 36%, simple tools ca. 48%, and bifacial tools ca. 16%) links the Sukhaya Mechetka assemblage to the Staroselian facies of the

TABLE 25-8
Distribution of Eastern European Micoquian assemblages according to ratios of bifacial, simple, and convergent tools

High amount of bifacial tools; simple dominating the convergent tools	*High-mid amount of bifacial tools; simple dominating the convergent tools*	*Mid-Low amount of bifacial tools; simple dominating the convergent tools*	*Low amount of bifacial tools; simple dominating or equal to convergent tools*
Sary Kaya, 1977	Zaskalnaya VI, II	Sukhaya Mechetka	Prolom II, IV
Ripiceni-Izvor, IV, V	Kabazi II, III		Zaskalnaya VI, IV
	Chokurcha I, IV		Chokurcha I, IV-O
	Antonovka I		Mezmaiskaya, 2-2A
	Antonovka II		Barakaevskaya
			Gubs shelter #1
			Prolom II, II
			Prolom II, III
			Mezmaiskaya, 2B-4
			Mezmaiskaya, 3

Crimean Micoquian, as well as being very similar to Mezmaiskaya layers 2B-4 and 3 in the Northern Caucasus (Table 25-8).

The Cheluskinets II assemblage was called Micoquian based on a single bifacial tool found in the scree near the site profile (Kuznetsova and Sergin 1999:103). While it may be related to the archeological layer, additional data are required before any judgment can be made about this site's industrial status.

Prut-Dniester

The most representative Micoquian assemblages in the Prut-Dniester region are from Ripiceni-Izvor Mousterian layers IV and V. The core reduction strategy was based on the reduction of parallel and unsystematic cores. A few Levallois tortoise cores were also reported. The bifacial tools in the assemblages were plano-convex.

The layer IV tool assemblage is dominated by simple scrapers, including some with "bifacial retouch," as well as denticulates, notches, and bifacial leaf-shaped points. In Layer V, simple scrapers also are most numerous, followed by denticulates and notches, while "scrapers with bifacial retouch" and bifacial leaf-points are rare (Păunescu 1993:92, 118). Convergent scrapers, including *déjeté* scrapers, are not numerous. The bifacial leaf-points are both symmetric and asymmetric (Figure 25-9: *3*) (Păunescu 1993:107), and most bifacial scrapers are triangular and ovoid. In addition, there were backed bifacial tools, referred to as Prondniks (Păunescu 1993:113, 126). Păunescu provided several values of bifacial tool indices (Păunescu 1993:93, 120), but the percentage of bifacial tools, in our terms, approaches 20%.

Thus, the assemblages from Ripiceni-Izvor Mousterian layers IV and V, are characterized by a relatively high percentage of bifacial tools (among all scrapers, points, and bifacial tools). One of the closest analogies to this Micoquian might be the assemblage found in 1977 at the Crimean Micoquian Ak-Kaya facies site of Sary-Kaya (Table 25-8).

It is also most likely that the few bifacial plano-convex tools found in the small artifact collections from Ripiceni-Izvor Mousterian layer VI, Kolodiev (depth 12.5-12.9 m), and Yezupil layer II belong to the Eastern Micoquian complex (Păunescu 1993: 126–130; Sytnyk et al. 1996:90–91; Sytnyk 2000:336), but to which facies is unknowable.

Micoquian Variability

In sum, the Eastern European Micoquian is technologically homogeneous but typologically proportionately variable (Figure 25-9). The raw material exploitation technologies of all assemblages are based on both non-Levallois flake core reduction and the plano-convex method of bifacial tool production. All the known facies—defined by proportional variations in toolkits—are found in Crimea, where the largest number of Micoquian occupations are known and extensively published (Table 25-8). It is most likely that the toolkit varieties of Micoquian assemblages in other regions reflect the same economic status of settlements and differential availability of raw material, just as they do in Crimea. The facies of the Eastern Micoquian in Crimea exhibit more typological variability than in all other Eastern European Micoquian assemblages combined. For instance, there is no analogy to the typological structure of the Kiik-Koba facies in any assemblage outside of Crimea. This might well reflect the unique combination of natural and anthropological events on the peninsula that were responsible for the development of the Kiik-Koba facies (Chabai 1999a:71–73).

The Levallois-Mousterian Industry

The Levallois-Mousterian is found in two regions: in Crimea and the Prut-Dniester Basins. Assemblages with a pronounced Levallois component in Crimea were called "Western Crimean Mousterian," while in the Prut-Dniester region they were called "Molodova Mousterian Culture" (Chabai 2000b; Sytnyk 2000). For both regions, the common technological and typological characteristics of these Levallois-Mousterian assemblages are: a combination of Levallois tortoise and uni- and bidirectional blade technologies; a dominance of simple scrapers and a relative rarity of convergent scrapers, denticulates, and notches; and the use of flat, non-invasive scalar retouch (Figure 25-10). During core reduction, supplementary platforms and main platform(s) preparation were widely used. There is no evidence for any bifacial tool technology (biconvex or plano-convex) in the Levallois-Mousterian in Eastern Europe. The most salient difference between the Eastern European Levallois-Mousterian and Micoquian lies in the fundamentally dissimilar technologies used for blank and tool production.

Crimea

There are two chronological stages seen in the Western Crimean Mousterian (Chabai 1998b, 1998c, 2000b). The early stage is found at Shaitan-Koba upper level and Kabazi II level IIA/2 through II/7. The late one occurs in Kabazi II levels II/6 through A3A. The technological difference between these stages lies in the use of Levallois and/or blade technologies. During the early stage, both technologies were used. The Levallois technology utilized tortoise cores, and unidirectional and bidirectional parallel cores were used for blade production. In the early Western Crimean Mousterian, these blade cores have supplementary platforms and faceted striking platforms. Some volumetric blade

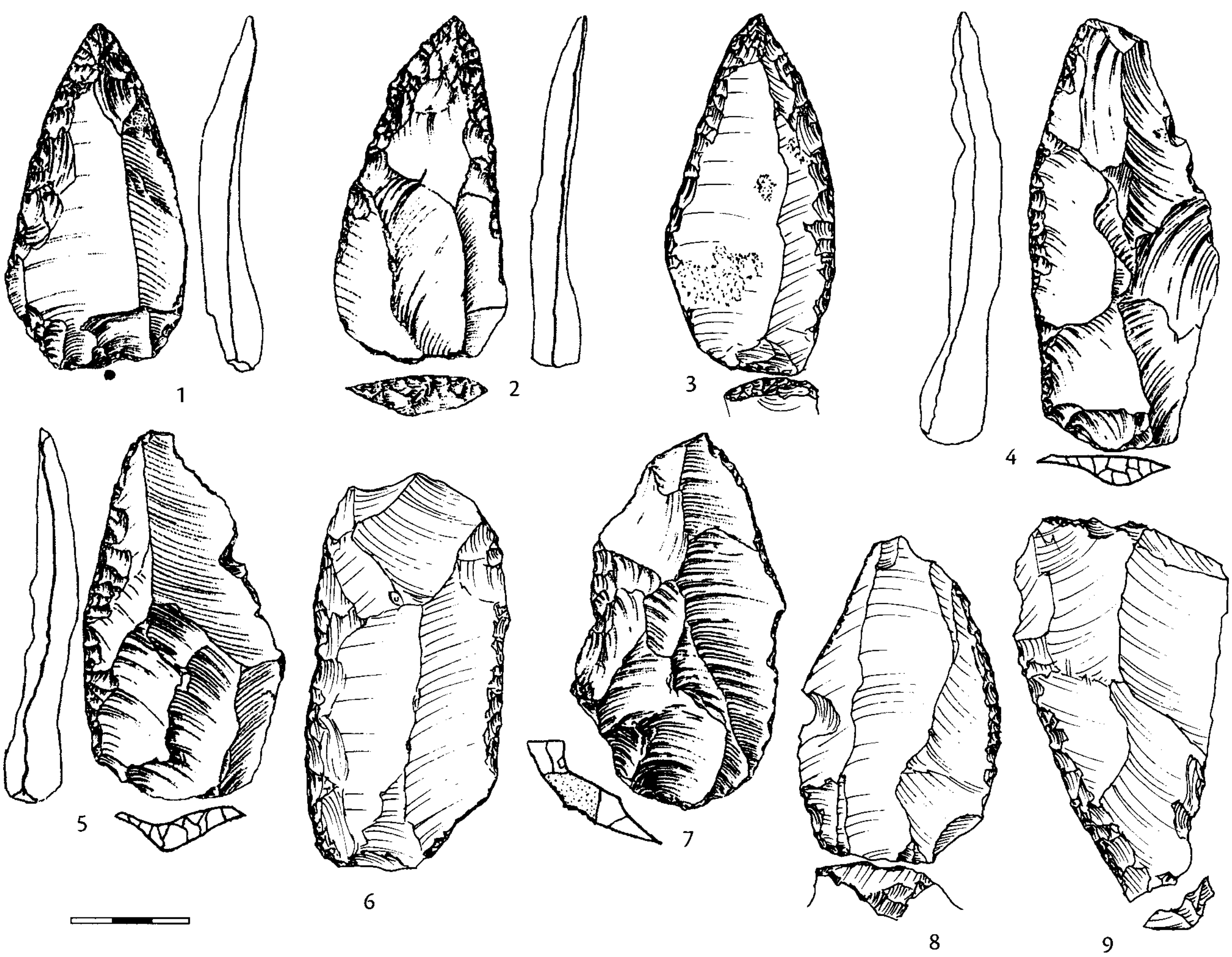

Figure 25-10—Eastern European Levallois-Mousterian semi-leaf (1, 3) and semi-crescent (2) points, convex scrapers (4, 5, 8), straight scraper (9), double straight scraper (6), retouched piece (7). Tools made on Levallois blanks (2, 4, 6) and on enlèvements II (5, 7). Kabazi II level II/8 (1, 2, 4, 5, 7); Molodova I layer 4 (3, 6, 8, 9) (after Chabai 1998b, 1998c; Chernysh 1982).

cores were also found in the early stage. There is no Levallois technology used in the late Western Crimean Mousterian; blank production was limited to the use of parallel blade cores, some of which are conceptually volumetric. The technological differences between the early and late stages are reflected by the proportions of blades and faceted platforms. In the early stage, the average blade index is 19 and the average faceting indices are IFs = 52 and IFl = 69. In the late stage, the blade index rises sharply to 35, while the faceting indices drop to 37 and 58, respectively.

In spite of these technological differences, the typological structure of the toolkits is almost identical. In both stages, simple lateral scrapers (Figure 25-10: *4, 5*) account for between 55% and 70% of all tools, while convergent scrapers are rare. Points vary from 14% to 25% but, unlike in the Micoquian, most are distal and lateral, although some sub-triangular, semi-crescent, and semi-leaf points (Figure 25-10: *1, 2*) occur. Denticulates and notches never exceed 15% of the toolkits. More than one-half of the tools are on either blades or elongated Levallois blanks (Figure 25-10: *2, 4, 5, 7*). Usually, tools have non-invasive, flat scalar retouch. In spite of the marked elongation of the tools, Upper Paleolithic types are very rare and in most assemblages are not present, at all.

Prut-Dniester

The Levallois-Mousterian of the Prut-Dniester region is found in the following assemblages: Yezupil layer III, Proniatin, Ripiceni-Izvor layers I–III, Molodova I layers I–IV, Molodova V layers 11–12, Bugliv V layer II, and Igrovitsa I layer II (Chernysh 1965, 1982, 1987; Păunescu 1993; Sytnyk 2000).

Differences do occur among assemblages in the proportion of core types and the percentage of blades produced. The cores at Yezupil layer III are mainly uni- and bidirectional (Sytnyk 2000:254), while Levallois tortoise cores are most pronounced at Proniatin, Molodova I layers I–IV, Molodova V layers 11–12, and Ripiceni-Izvor layers I–III. In fact, the oldest assemblage, Yezupil layer III, has the highest blade component: Ilam = 25. Blade indices for other assemblages range from about 13 to 15, and rarely exceed 20. All of the Levallois-Mousterian assemblages, except Ripiceni Izvor layers I–III, have high faceting indices (IFs = 45–55, IFl = 60–70). In spite of the pronounced Levallois element in core and blank production, platform preparation at Ripiceni-Izvor layers I–III is relatively low (IFs 28–40, IFl = 31–44). It is likely that these variations within a shared technology reflect minor differences in raw material economy brought about by distance from raw materials, raw material packaging, and the intensity and duration of occupations.

The toolkits of these assemblages are dominated by simple lateral scrapers (Figure 25-10: *8, 9*), with points, mainly sub-triangular and semi-leaf (Figure 25-10: *3*), varying from 5% to 20%. There are a few Levallois points, scrapers made on Levallois blanks are common (Figure 25-10: *6*), while denticulates and notches are rare. "Upper Paleolithic" tool types are uncommon. Almost all tools have non-invasive, flat scalar retouch (Figure 25-10: *3, 6, 8, 9*).

Levallois-Mousterian Variability

It is possible to divide the Eastern European Levallois-Mousterian into two groups, one of which has only rare blade production and the other where blade technology is very developed. These groupings, however, seemingly have no chronological significance. At least, the earliest Levallois-Mousterian assemblage from Yezupil layer III has about the same level of blade technology as the assemblages of the late Western Crimean Mousterian, despite their ca. 100,000-year time difference. Thus, it appears that blade technology in the Levallois-Mousterian has no evolutionary significance. Most likely, the degree to which blade technology was used was an adaptation to different economic and environmental conditions.

The Blade Mousterian

Blade Mousterian assemblages are found only during the 1st Period in the Don River Basin and its tributary, the Seversky Donets Basin. The Blade Mousterian is found in the following sites: Kurdumovka, Belokuzminovka layers 2 and 3, Zvanovka, and Shlyakh (Kolesnik 1993, 1994a, 1995; Nehoroshev 1996; Nehoroshev and Vishnyatsky 2000).

The core reduction strategy in the Blade Mousterian is based solely on unidirectional and bidirectional volumetric cores (Figure 25-11: *6, 7*), on which supplementary platforms and faceted platforms are uncommon. Blades (Figure 25-11: *1-5, 8*) account for 20% to 30% of all blanks, while blanks with faceted platforms are uncommon: IFs = 22–40, IFl = 40–60. According to Kolesnik (2000:78), the core reduction strategy was based on that described for Rocourt (Otte et al. 1990). On the other hand, according to Nehoroshev and Vishnyatsky (2000:265), the core reduction strategy is very close to that described for Roc-de-Combe layer 8 by (Pelegrin 1990). In any case, both the Rocourt and Roc-de-Combe methods are very different from the early and late Western Crimean Mousterian blade technology, as described above.

Toolkits include points (Figure 25-11: *1-3*), simple (Figure 25-11: *9, 10*) and double scrapers, denticulates, and notches. Convergent scrapers are rare. The most characteristic tool type is the truncated-faceted and bi-truncated-faceted piece (Kolesnik 1994b), which was widely used. Even some points and scrapers have truncated-faceted bases. Nehoroshev and Vishnyatsky (2000:260) reported some atypical endscrapers and

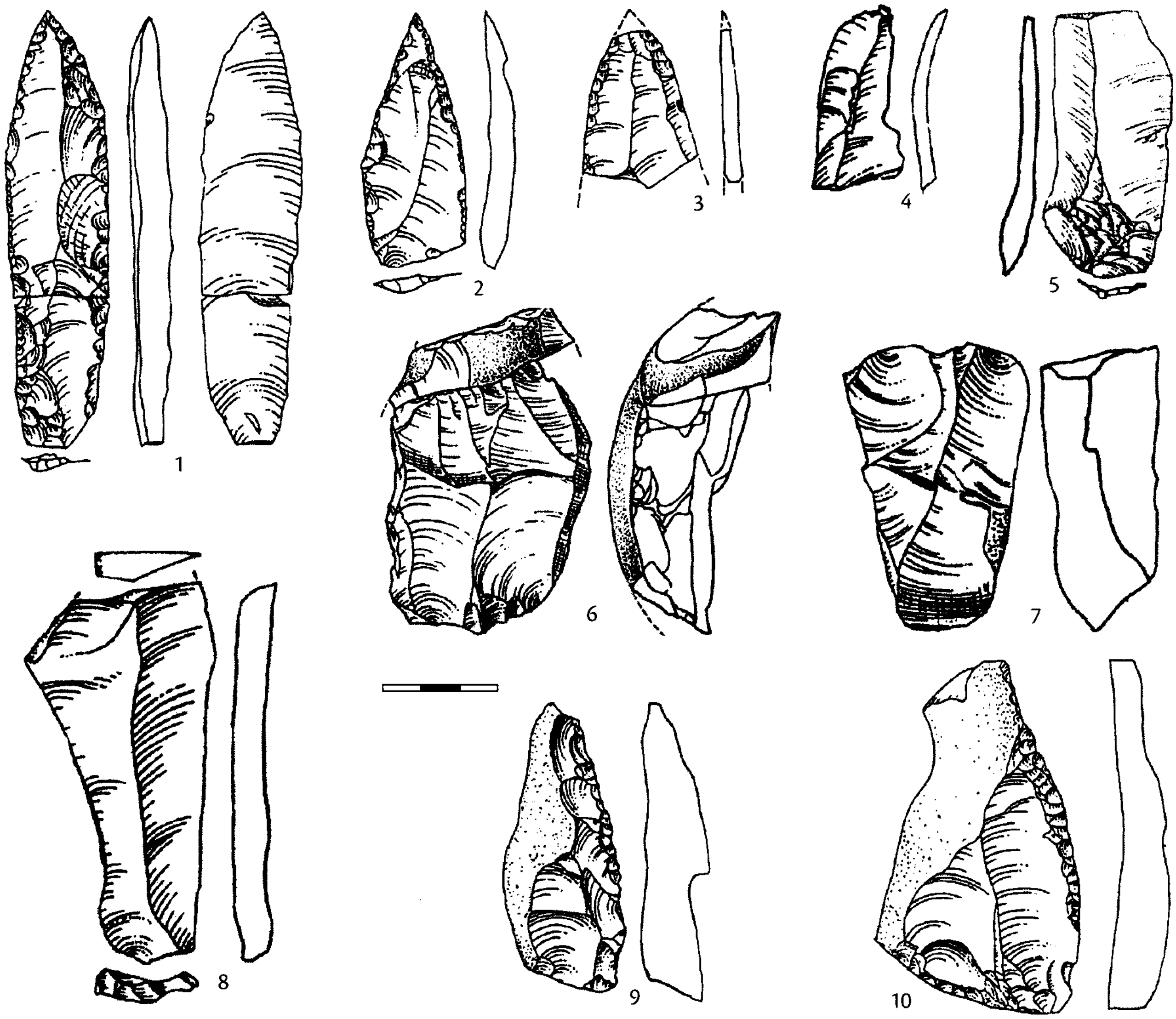

Figure 25-11—Eastern European Blade Mousterian points on blades (*1, 2, 3*), blades (*4, 5, 8*), cores (*6, 7*), and convex scrapers (*9, 10*) from Kurdumovka (after Kolesnik 1994a, 2000).

burins at Shlyakh but, according to them, these tools "are crude and inexpressive." Usually, non-invasive, flat scalar retouch was used in tool production.

Thus, the Blade Mousterian assemblages have both a typological and technological distinct repertoire when compared to the Micoquian or Levallois-Mousterian. Unlike the Micoquian and Levallois-Mousterian, Blade Mousterian assemblages are very homogeneous and do not show any significant technological, typological, chronological, or geographic variations.

The Streletskaya

Streletskaya assemblages are found in the Mid Don, the Lower Don, Crimea, and Central and Northern Urals; the largest distribution for any 3rd Period industry. They all share the common technological and typological features of the production of thin, bi-convex bifacial tools; the presence of bifacial leaf-shaped and triangular points (many of the latter with concave bases); and fan-shaped and laterally retouched endscrapers on flakes, sometimes with thinned base (Figure 25-12). In spite of its Upper Paleolithic attribution, there is no blade technology and there are very few burins.

This combination of technological and typological traits is unique in Eastern Europe and without obvious, direct connections to earlier, contemporary, or succeeding industries. Anikovich (1991) proposed the term "Eastern Szeletian" for the Streletskaya assemblages to underline the presence of bifacial tools in this Upper Paleolithic industry. The same rational was

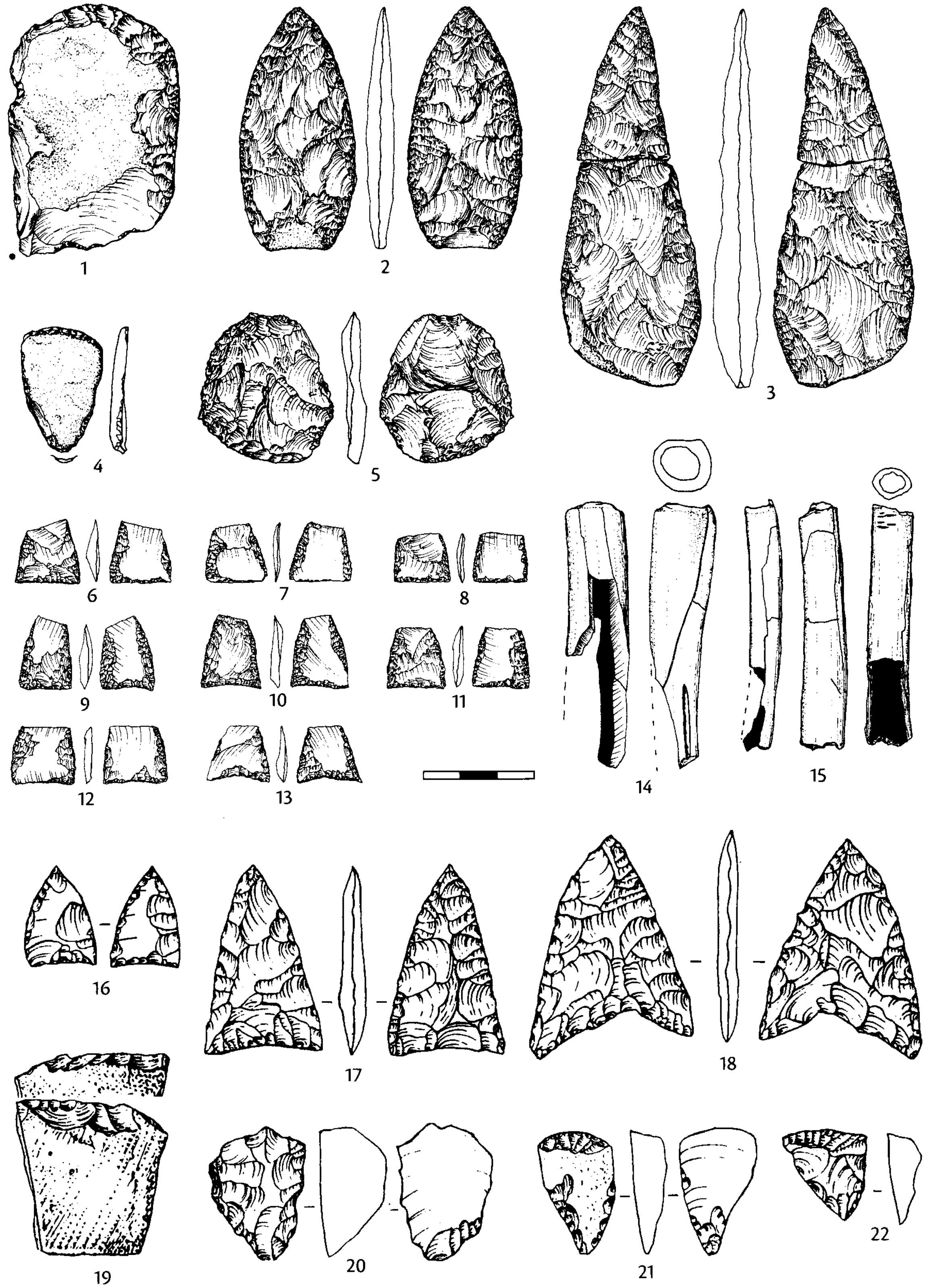

Figure 25-12—Streletskaya complex endscrapers (*1, 4, 20, 21, 22*), bifacial leaf-shaped points (*2, 3*), core (*5*), bifacially retouched "trapezoids" (*6–13*), worked bones (*14, 15*), bifacially retouched micro-point (*16*), bifacial triangular points with concave base (*17, 18*), and retouched flint plaquette (*19*) from Buran-Kaya III level C (1–15), Kostenki 1 layer V (16–18, 20–22), and Kostenki 12 layer III (19) (after Monigal 2001; Rogachev and Anikovich 1984).

used in reference to the assemblage from Buran-Kaya III level C (Marks 1998:362; Chabai et al. 1998:29-30; Monigal 2001:61). No suggestion of any direct connections between the Crimean Early Upper Paleolithic with bifacial tools and the Central European Szeletian was intended, although it confused some (e.g., Kozlowski 2000a:90).

Crimea

The only Crimean Streletskaya assemblage occurs at Buran-Kaya III level C. There is little evidence for any reduction strategy other than bifacial (Marks 1998; Monigal 2001, Chapter 5). Bifacial tool production technology, carried out by soft-hammer, was complex and involved a final thinning stage incorporating edge abrasion. The toolkit of Buran-Kaya III level C includes bifacial foliates (Figure 25-12: *2, 3*), endscrapers on laterally retouched flakes (Figure 25-12: *1, 4*), retouched pieces, and the most peculiar of artifacts—bifacially retouched microlithic trapezoids (Figure 25-12: *6–13*) (Marks 1998; Marks and Monigal 2000, 2003; Monigal 2001, Chapter 5). If the bifacial foliates and endscrapers (Figure 25-12: *4*) clearly resemble the same types in the Mid Don Streletskaya assemblages, the bifacial trapezoids are a new typological element in the European Early Upper Paleolithic. These bifacially retouched trapezoids have either straight (Figure 25-12: *6-8*) or concave (Figure 25-12: *9-13*) bases. The latter might be interpreted as similar to the bifacial micro-points found in most Streletskaya assemblages (Chabai 2000a:78). In addition, a few clearly worked bone tubes (Figure 25-12: *14, 15*) were recovered (Yanevich et al. 1997; d'Errico and Laroulandie 2000; Laroulandie and d'Errico, Chapter 7).

Mid Don

The largest Streletskaya assemblages come from Kostenki 12 layer III (108 tools) and Kostenki 1 layer V (119 tools) (Rogachev and Anikovich 1982c:139; Rogachev et al. 1982:65). The reduction strategies of both assemblages include bifacial and true flake-core exploitation. Bifacial tool production is characterized by soft hammer removals and edge abrasion. A special "thinning flake" method was also applied (Bradley et al. 1995, Anikovich et al. 1997). This technology produced bifacial points that are thin and wide, bi-convex, triangular, and leaf-shaped. The cores have mainly parallel single and double platforms and with flat flaking surfaces (Rogachev and Anikovich 1984:179).

The dominant tool classes in Kostenki 12 layer III and Kostenki 1 layer V are bifacial tools (17.6%–36.1%), endscrapers (16.6%–20.2%), and retouched pieces (ca. 30 %). Other tools include scrapers (5%–11.9%), points (< 3 %), perforators (< 3 %), burins (0.9%–6.7%), and *pièces esquillées* (1.9%–3.4%) (Rogachev and Anikovich 1982c:139; Rogachev et al. 1982:66).

Bifacial tools include unfinished forms, triangular and leaf-shaped points, asymmetric double pointed tools, "ovoid-shaped discoidal tools," knives, leaf-shaped points with convex bases shaped by abrupt retouch, and triangular points with concave bases (Figure 25-12: *17, 18*) (Rogachev and Anikovich 1982c: 139). At Kostenki 1 layer V, there were bifacial micro-points (Figure 25-12: *16*), which ranged in size between 2.0 and 2.5 cm (Rogachev and Anikovich 1984:181).

Endscrapers share a number of attributes: they are mainly small, their working ends are convex or straight, they are triangular-shaped with the scraping end on the wide distal extremity, and the bases of some have ventral retouch (Figure 25-12: *20, 21, 22*) (Rogachev and Anikovich 1982c:139). Two forms were noted: sub-triangular endscrapers with straight lateral and distal edges and heart-shaped endscrapers (Rogachev et al. 1982: 65).

Scrapers are mainly straight, convex, or wavy and are closer to retouched pieces, rather than to Middle Paleolithic scrapers. The few burins are transverse plan.

Rogachev and Anikovich (1984:179–181) thought that the Kostenki 1 layer V and, especially, Kostenki 12 layer III assemblages had significant "archaic Mousterian forms," including "ovoid shaped discoidal tools," scrapers (Figure 25-12: *19*), points, and bifacial "knives." The scrapers in question do not differ from the retouched pieces and can hardly be considered an "archaic Mousterian element." In addition, technological studies by E. Giria (1999) document that the "archaic Mousterian" bifacial tools are merely preforms for bifacial triangular point production and that the Streletskaya bifacial technology was wholly Upper Paleolithic, showing no "transitional" features (Giria 1999:51–52).

Streletskaya Variability

There are a number of poorly dated Streletskaya assemblages, both north and south of the Kostenki-Borshchevo area. The most northern, from the north-eastern extremity of Eastern Europe, near the western slopes of the Northern and Central Ural Mountains (Guslitzer and Pavlov 1993: 182), are at Garchi I and Byzovaya and are thought to date to ca. 25,000 BP. Halfway between Kostenki-Borshchevo and Crimea in the lower Seversky Donets Valley, another Streletskaya assemblage was found at Birioutchia Balka 2 layer 3 (Matioukhine 1998), above the Bryansk-Arcy soil (Figure 25-2).

All Streletskaya assemblages are based on the same bifacial technology. Yet, there are some variations in tool typology. Birioutchia Balka 2 layer 3 contains a more pronounced component of the characteristic bifacial triangular points with straight and slightly concave bases than reported for Kostenki 12 layer III and Kostenki 1 layer V. This feature makes Birioutchia

Balka 2 layer 3 more similar to the mixed assemblage from Sungir, which is considered by some to be a late form of the Streletskaya (see above). Birioutchia Balka 2 layer 3 also contains more micro-points than the Mid Don assemblages. Along with trapezoidal microliths, Buran-Kaya III level C differs from the other Streletskaya toolkits by the presence of bone artifacts. At the same time, all homogeneous Streletskaya assemblages lack Micoquian and Aurignacian typological and technological elements. An attempt to link the triangular bifacial and unifacial scrapers, found in the Micoquian of Zaskalnaya V layers II through IV, with the bifacial triangular points of Streletskaya (Anikovich 2000:27) is not supported by comparative technological analyses of Micoquian and Streletskaya bifacial technologies. Thus, quite apart from their partial contemporaneity, there is no archeological evidence for the origin of the Streletskaya in an acculturation of Crimean and Northern Caucasus Micoquian peoples by Aurignacian "newcomers," as proposed elsewhere (e.g., Anikovich 1992, 2000; Cohen and Stepanchuk 1999, 2000).

The Spitsynskaya

There is only one reliable Spitsynskaya assemblage, Kostenki 17 layer II, although there is an additional candidate at Kostenki 12 layer II (Boriskovski et al. 1982: 186). According to Rogachev and Anikovich (1982c), however, the typological definition of this latter assemblage is far from clear.

Only blade technology was used in the Spitsynskaya and it was based on parallel, prismatic, single and double platform cores with volumetric flaking surfaces (Figure 25-13: *13*). While there is only a single assemblage, there are about 330 tools from layer II of Kostenki 17. Burins dominate, comprising about 48% of the toolkit, and include burins on oblique truncations, double opposed burins on oblique truncations ("parallelograms" according to Boriskovski), plus dihedral and angle burins in fewer numbers (Figure 25-13: *5-12*). Endscrapers, comprising about 7% of the toolkit, are typically ovoid on flake with retouched edges and simple blade endscrapers (Figure 25-13: *1-4*). There are points on blade (ca. 3%), scaled pieces (5%), and non-geometric microliths (1.2%: one obversely retouched micro-blade, and three fragments of backed micro-blades/bladelets) (Boriskovski et al. 1982: 185-186).

Bone and ivory artifacts are represented by two awls made on hare and polar fox humeri, three fragments of bone points, and one fragment of worked mammoth tusk (Figure 25-13: *21, 22*).

Personal adornments include pendants made on polar fox teeth, stone, belemnites, shells, and fossil corals (Figure 25-13: *14-20*). According to S.A. Semenov, the holes in the teeth and stone were drilled, although there is no indication that this was done with a bow drill (Boriskovski et al. 1982:186).

Two cultural linkages for the Spitsynskaya have been proposed: Gravettian (Kozlowski 1986) and Aurignacian (Anikovich 1993). It seems clear, however, that Sinitsyn (2000:141) was correct when he commented that these attributions were based on the "desire of both authors to find in this material the support for their constructions, rather than its real context." It does seem clear that the Spitsynskaya is typologically distinct from all so far defined Upper Paleolithic industries.

The Gorodtsovskaya

The Gorodtsovskaya assemblages are also limited to the Mid Don region: Kostenki 15, Kostenki 14 layer II, Kostenki 12 layer I, Kostenki 16, and, probably, Kostenki 14 layer III (Rogachev and Anikovich 1982c; Rogachev and Sinitsyn 1982; Rogachev and Anikovich 1984; Sinitsyn 1996:284).

Technologically, the Gorodtsovskaya assemblages are characterized by the production of flakes and blades from unsystematic and parallel cores, the latter usually exhibiting a volumetric flaking surface (Figure 25-14: *22*). Bifacial tools are rare and unstandardized. There are some technological variations within the Gorodtsovskaya. Such assemblages as Kostenki 15 and Kostenki 14 layer II were based on flake cores (Figure 25-14: *23*), while the assemblages from Kostenki 12 layer I and Kostenki 14 layer III have a dominant blade technology. This difference was considered developmental and "progressive" through time (Rogachev and Anikovich 1984:185). Yet, the "progressive" assemblage from Kostenki 14 layer III is stratigraphically lower than the "archaic" assemblage from layer II of the same site.

The largest Gorodtsovskaya toolkits were found in Kostenki 15, Kostenki 14 layer II, and Kostenki 12 layer I. Endscrapers are most numerous, followed by good numbers of scaled pieces at Kostenki 15, "archaic Mousterian" tools at Kostenki 14 layer II, and by burins at Kostenki 12 layer 1. Another "progressive" change is seen in the appearance of 11 microliths (7 backed micro-blades and 4 points on micro-blades) at Kostenki 12 layer 1 (Rogachev and Anikovich 1982c: 136).

Endscrapers include those with parallel edges made on blades (Figure 25-14: *6-8*) and those with expanding edges made on flakes (Figure 25-14: *1-5*). The most common parallel-edged endscrapers are thick and abrupt, while the fan shaped endscrapers often have ventral thinning. Double endscrapers with retouched lateral edges are also common (Figure 25-14: *9*) and are similar to limaces (Figure 25-14: *10*), which are also present in Gorodtsovskaya assemblages.

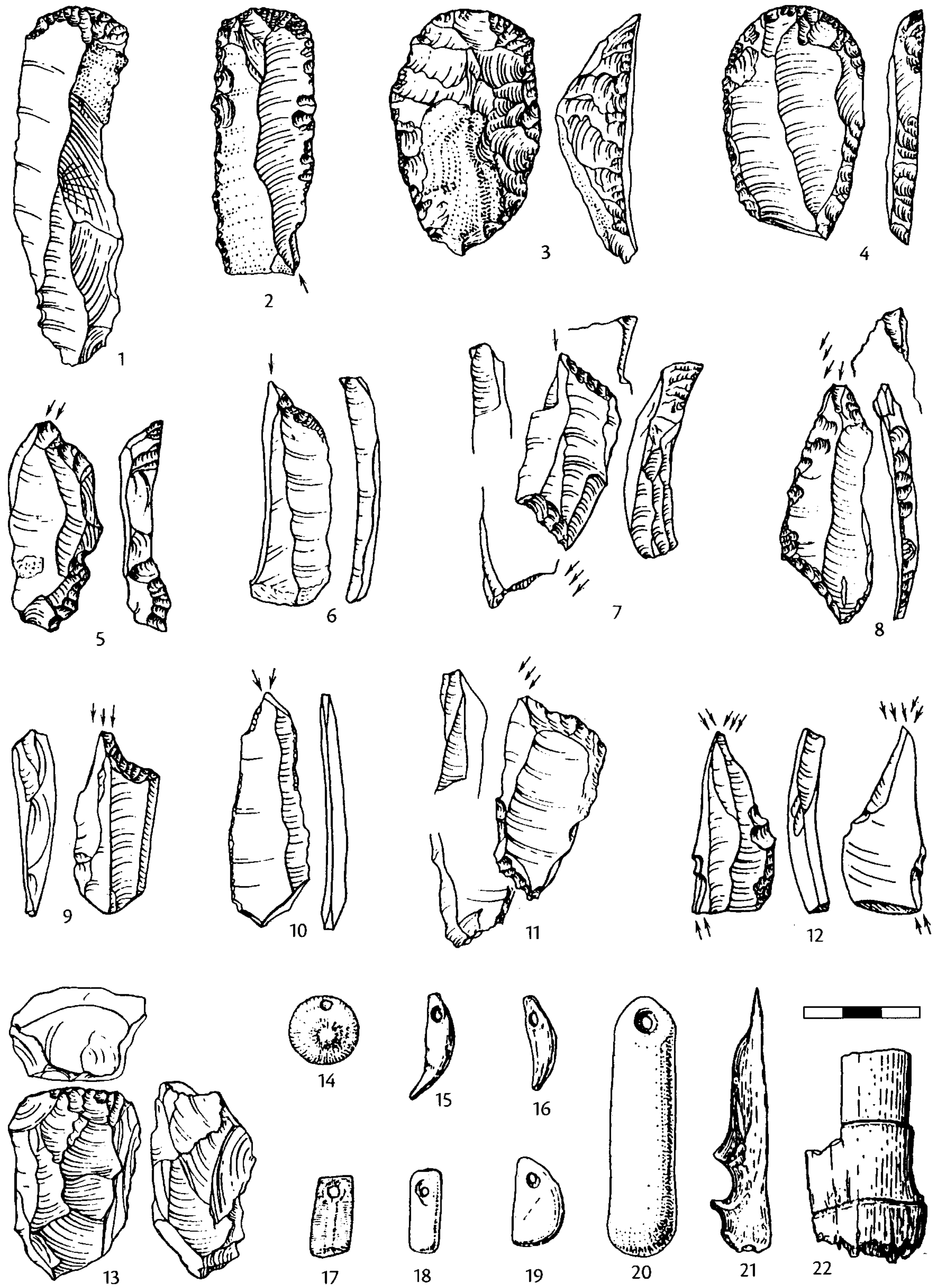

Figure 25-13—Spitsynskaya endscrapers (*1–4*), burins (*5–12*), core (*13*), adornments made on shell (*14*), teeth (*15, 16*), stone (*17–20*), awl (*21*), and worked mammoth tusk (*22*). All from Kostenki 17 layer II (after Boriskovski et al. 1982).

Other tools include scaled pieces (Figure 25-14: *11-18, 21, 23*) of various forms (Rogachev and Sinitsyn 1982a:154, 1982b:168;), dihedral burins at Kostenki 15, and both dihedral and angle burins at Kostenki 12 layer I, but no burins in Kostenki 14 layer II (although three burin spalls were found) (Rogachev and Sinitsyn 1982a:154).

The bone and ivory artifacts of the Gorodtsovskaya are characterized by a striking variety of shapes: "shovels" with nail-like heads made on mammoth long bones; points of different types, including needle-like ones; awls; retouchers; polishers; and pendants (Rogachev and Sinitsyn 1982a, 1982b; Sinitsyn 1996). The shafts of the "shovels," bone points, and tube bone fragments were decorated with complex bands of geometric incisions (Figure 25-15: *1, 2, 6, 8, 12, 14, 15, 16*). Three types of pendants have been reported: decorated bird bones, drilled stone pieces, and drilled shells (Figure 25-15: *2, 8, 12*) (Rogachev and Sinitsyn 1982a, 1982b).

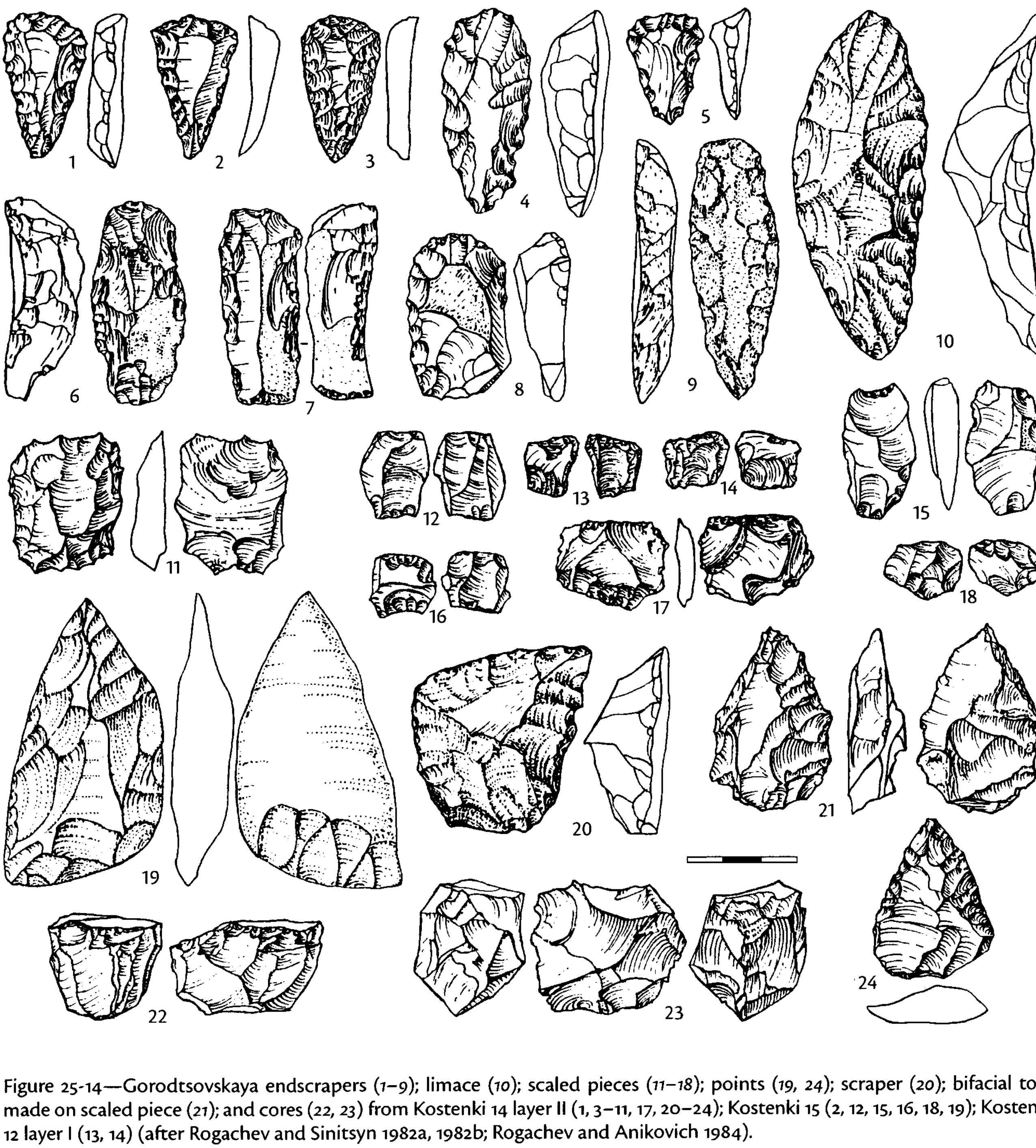

Figure 25-14—Gorodtsovskaya endscrapers (*1–9*); limace (*10*); scaled pieces (*11–18*); points (*19, 24*); scraper (*20*); bifacial tool made on scaled piece (*21*); and cores (*22, 23*) from Kostenki 14 layer II (1, 3–11, 17, 20–24); Kostenki 15 (2, 12, 15, 16, 18, 19); Kostenki 12 layer I (13, 14) (after Rogachev and Sinitsyn 1982a, 1982b; Rogachev and Anikovich 1984).

The perceived "archaic Mousterian elements" include simple, transverse, canted and double canted scrapers (Figure 25-14: *20*), convergent scrapers, points (Figure 25-14: *19, 24*), limaces (Figure 25-14: *10*), and small bifacial tools (Figure 25-14: *21*). As already noted, some of these are very similar to scaled pieces and end-scrapers and Sinitsyn (1996:283) has remarked that the Mousterian tools "have the same kind of retouch and were made in the same way as other unquestionably Upper Paleolithic type tools."

The mere presence of tool forms in the Upper Paleolithic that also are found in the Middle Paleolithic does not imply the *continuation* of any "archaic" element. After all, pebble choppers are known in the

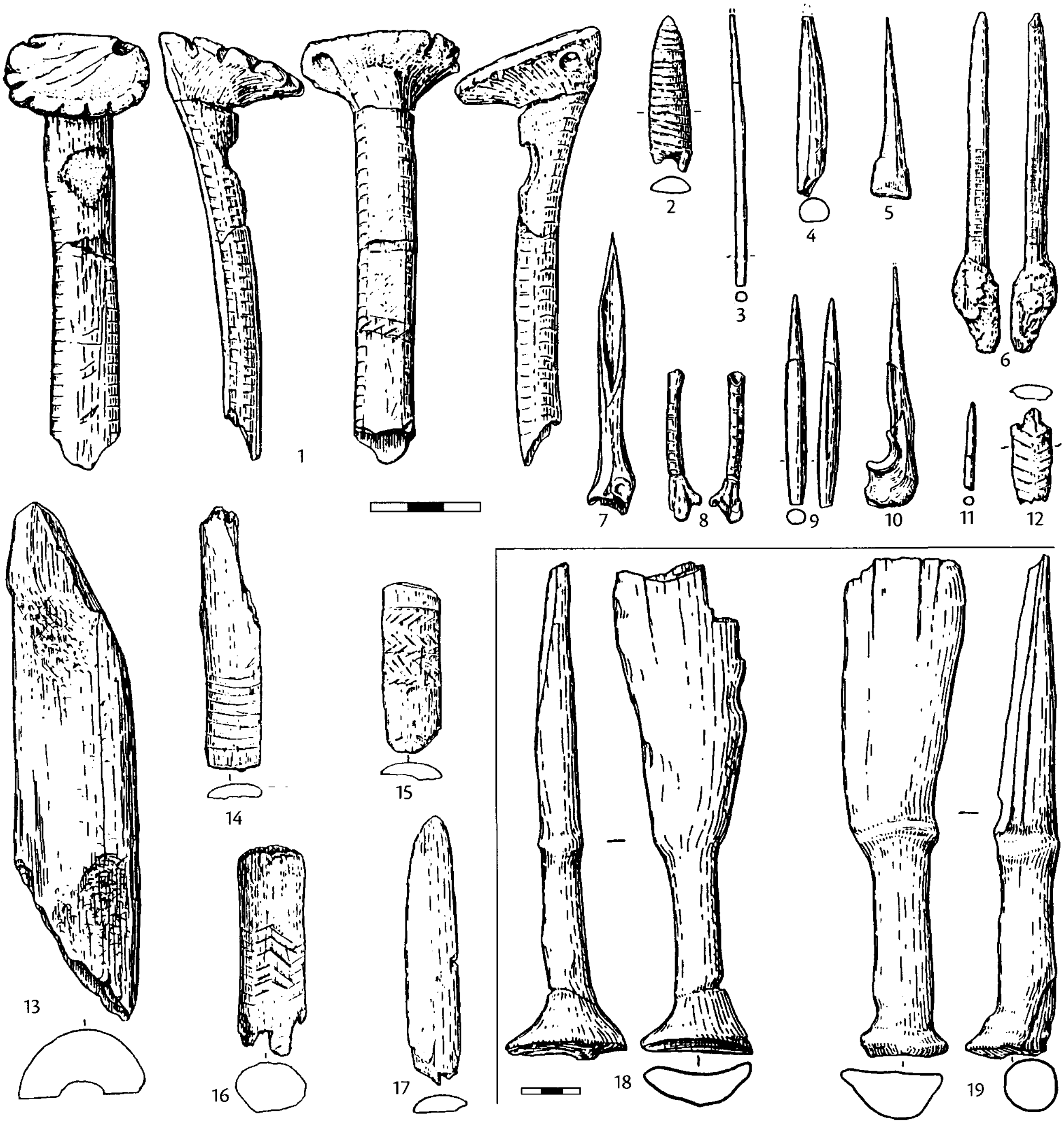

Figure 25-15—Gorodtsovskaya assemblages decorated handle with nail-like head (*1*); pendants (*2, 8, 12*); needles (*3, 11*); points (*4, 9*); awls (*5, 7, 10*); point with zoomorphic head (*6*); retoucher (*13*); decorated bone fragments (*14–16*); "polisher" (*17*); "shovels" on long mammoth bones with nail-like heads (*18, 19*) from Kostenki 14 layer II (1–17) and Kostenki 15 (18–19) (after Rogachev and Sinitsyn 1982a, 1982b).

Neolithic (Bordes 1961:47) and Middle Paleolithic-like sidescrapers have been found in sufficient numbers in Upper Paleolithic contexts to have been included in the de Sonneville-Bordes type list for the Western European Upper Paleolithic (de Sonneville-Bordes and Perrot 1953, 1956). Yet, here it is striking that such elements as ventral thinning and invasive retouch, seen so commonly in the local Micoquian, also occur in this clearly Upper Paleolithic context. The "archaic" character of Kostenki 14 layer II might be due to the low quality of raw material used by the inhabitants of this occupation (Rogachev and Sinitsyn 1982a:149), since in the other Gorodtsovskaya assemblages raw material of much better quality was utilized. Thus, whether these "archaic" forms imply continuity must be balanced against the possible effects of flaking different raw materials, since virtually all the proposed "archaic elements" occur on low quality gray flint, while all the "typical" Upper Paleolithic elements are on high quality flint (Rogachev and Sinitsyn 1982a:157, 1982b:163).

The stone and bone material culture of the Gorodtsovskaya has a distinct character both technologically and typologically. No true Micoquian bifacial plano-convex tools, no Aurignacian carinated technology, and no bone points characteristic of the Aurignacian are seen in the Gorodtsovskaya. In spite of this, Gorodtsovskaya origins have been accounted for by acculturation of the Micoquian by the Aurignacian (Cohen and Stepanchuk 2000). The variability among the Gorodtsovskaya assemblages might be explained in terms of different economic activities and different sources of raw exploitation, rather than by developmental changes.

The Aurignacian

Stratified *in situ* Aurignacian assemblages in Eastern Europe occur in the Prut River Valley, in Crimea, and in the Mid Don Valley. The assemblages from Crimea (Siuren I) and the Mid Don (Kostenki 1 layer III) belong to the Krems-Dufour variant of Aurignacian (Hahn 1977; Demidenko et al. 1998), while the typological definition of Mitoc Malul Galben from Prut is more complicated.

Crimea

Technologically, the Siuren I Aurignacian assemblages have a pronounced component of bladelets and microblades. Together, these account for about 40% to 50% of all blanks, while only 20% of the blanks are true blades. The bladelets and microblades are associated with both carinated cores (Figure 25-16: *14, 17*) and endscrapers, as well as with "regular" bladelet/ microblade cores. Dufour (Figure 25-16: *2, 4, 5, 6, 9*) and pseudo-Dufour bladelets and microblades make up about half of all toolkits. A few Krems points occur (Figure 25-16: *1, 3, 7, 8*), while the rest of the tools are typically Aurignacian: blades with "Aurignacian-like" retouch (Figure 25-16: *20*), carinated endscrapers and burins (Figure 25-16: *12, 13, 15, 16, 18, 19*), and thick nosed/ shouldered scrapers (Figure 25-16: *10, 19*). Moreover, bone points and awl fragments, as well as marine shell pendants are common (Demidenko et al. 1998; Demidenko and Otte 2000–2001).

Some of the occupational levels of units G and H of Siuren I contain about 10% Middle Paleolithic type tools, such as bifacial scrapers, points, and convergent and simple scrapers. Although it has been assumed that Aurignacian people were responsible for such archaic tool types (e.g., Kozlowski 2000a:99), detailed analysis of the Siuren I material indicates that Micoquian and Aurignacian groups visited the shelter at different times (Demidenko 2000).

Mid Don

The Aurignacian assemblage at Kostenki 1 layer III has a microblade technology (Rogachev 1957; Hahn 1977; Rogachev et al. 1982). About half of all cores are true microblade cores. The most common tool types are Dufour (Figure 25-16: *26-30*) and pseudo-Dufour (Figure 25-16: *31*) microblades, comprising about 50% of the toolkit. Krems points occur (Figure 25-16: *22-24*), endscrapers (ca. 20%) include carinated and shouldered examples (Figure 25-16: *32, 34*), and burins, including carinated forms, are relatively rare (Figure 25-16: *29, 36*). There are a few points on blades and a number of retouched flakes and blades, including one with "Aurignacian retouch" (Figure 25-16: *35*).

Bone and ivory tools consist of bone awls, points (Figure 25-16: *33*), and rods made on mammoth tusk fragments. Fragments of bone points are decorated with parallel scratches. Personal ornaments consist of perforated shells and fox teeth, as well as rods decorated with transverse parallel incisions (Hahn 1977; Rogachev et al. 1982).

Two other certain Aurignacian sites are known: Chulek I in the Lower Don Valley (Gvozdover 1964) and Kamennomostskaya Cave in the Northern Caucasus (Formozov 1971) (Figure 25-2). While Chulek I was found in redeposited sediments of a low river terrace, recent technological and typological studies indicate it is a valid, homogeneous assemblage of Krems-Dufour type (Demidenko 2000-2001: 149–153). The Kamennomostskaya Cave assemblage, on the other hand, clearly contains artifacts from a number of different periods, from Chalcolithic through Middle Paleolithic, although a Krems-Dufour Aurignacian component is visible (Demidenko 2000-2001:153–160).

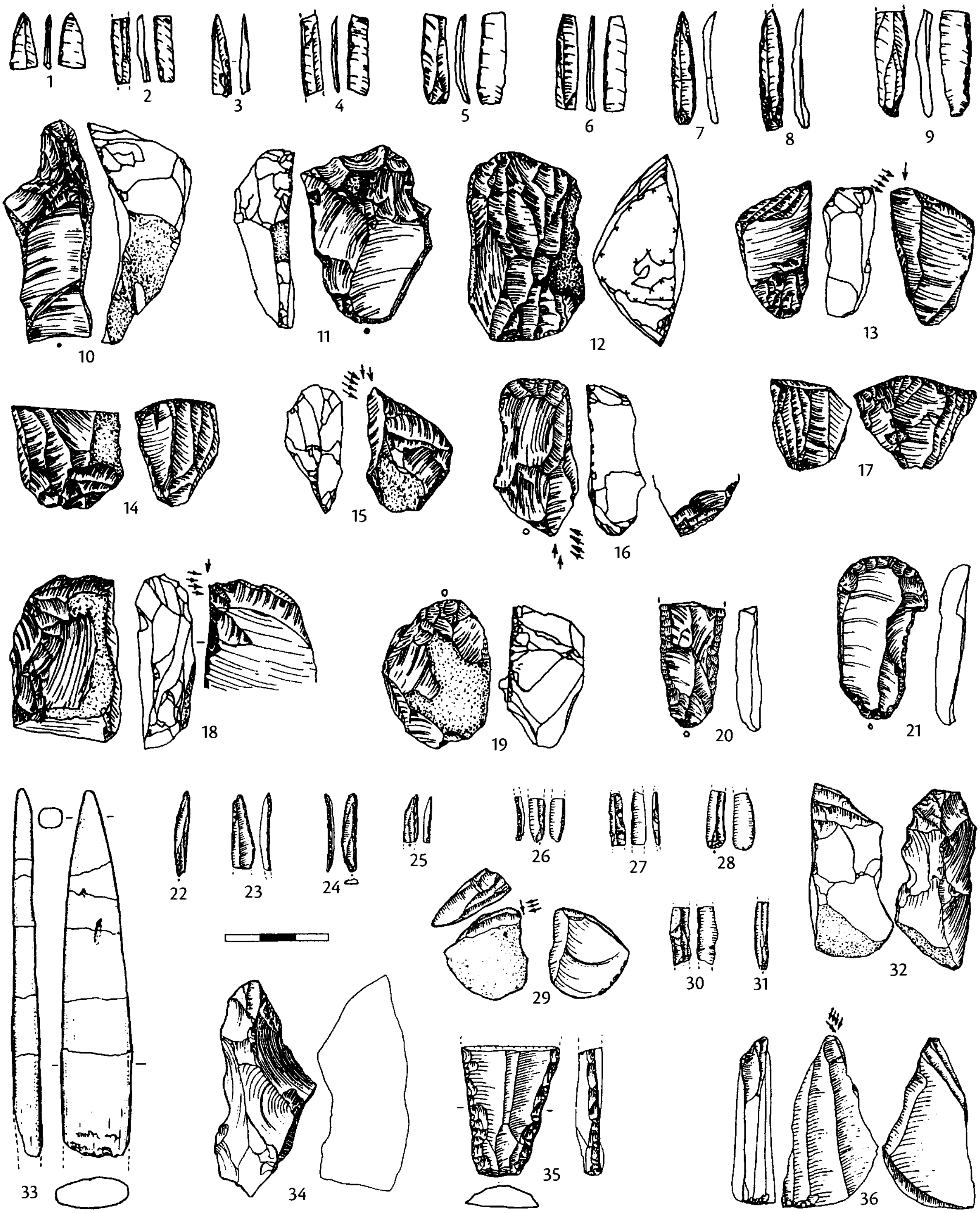

Figure 25-16—Aurignacian complex non-geometrical microliths: Krems points (*1, 3, 7, 8, 22–25*); Dufour microblades and bladelets (*2, 4, 5, 6, 9, 26, 27, 28, 30*); pseudo-Dufour microblade (*31*). Endscrapers: thick shouldered (*10, 11, 34*); carinated (*12, 19, 32*); on flake with bilateral retouch (*21*); carinated cores (*14, 17*); carinated burins (*13, 17, 18, 29, 36*); endscraper/carinated burin (*16*); blades with "Aurignacian-like retouch" (*20, 35*); point made on a mammoth tusk fragment (33). Siuren I levels H ( ), Gd ( ), Gc1-Gc2 ( ), Fb1-Fb2 ( ); Kostenki 1 layer III (22–36) (after Demidenko et al. 1998; Demidenko and Otte 2000–2001; Hahn 1977).

Prut-Dniester

In the Prut-Dniester region, Mitoc Malul Galben includes three Aurignacian occupations, all of which are basically similar in their technology, focusing on both blade and flake production. The presence of bladelet cores as well as carinated, nosed, and busked tool forms attest to the importance of bladelet production. Yet, there is a fairly high number of tools made on thick flakes (as well as cores), which might reflect the opportunistic use of waste from blank production. Blades are not very numerous, nor are bladelet tools, but given the evidence for true blade/bladelet technology (including crested blades and other core trimming elements), they were most likely taken away from the site (Otte et al. 1997).

The toolkit includes carinated endscrapers, carinated and busked burins, and simple burins on blades, as well as retouched, truncated, and pointed blades/bladelets. No Dufour bladelets have been found, although it has been suggested that they probably were made in at least one of the Aurignacian workshops and exported from the site (Otte et al. 1997:282). Denticulates, notches, and sidescrapers also occur in low numbers. A Mladeč point was recovered from the lowermost bone concentrations (Otte et al. 1997).

Aurignacian Variability

It appears that the Krems-Dufour type was the only Aurignacian in Eastern Europe, assuming that Mitoc Malul Galben was oriented toward Dufour production (Demidenko 2000–2001:161). The very few known Aurignacian sites in Eastern Europe, as a whole, their wide distribution throughout this huge area, without any known regional site clusters, and their relatively recent dates, certainly, mitigate against any model that postulates the Aurignacian as a source of "Upper Paleolithic" traits in Eastern Europe.

The Early Gravettian

The Early Gravettian occurs only in two regions: the Prut-Dniester Basins and in the Mid Don. If the Prut-Dniester assemblages are truly both chronologically and typologically Early Gravettian, the "Early Gravettian" of the Mid Don only reflects its chronological position.

Mid Don

The assemblage from Kostenki 8, layer II, was recognized as "Gravettoid" (Rogachev et al. 1982:102). The technology of this assemblage is based on blade and microblade production from unidirectional and bidirectional cores. A significant part of toolkit (900 of 2100 tools), is microliths, the most numerous type of which is a backed needle-like point with an obliquely retouched base. The sizes of microliths vary from 1 cm to 5 cm in length and from 0.1 cm to 0.5 cm in width (Rogachev et al. 1982:102). Burins, mostly angle, are also numerous: about 500 examples. Endscrapers are not numerous and tend to be simple on blade (about 50 pieces). Also, there are some points on blades, scrapers, perforators, denticulates, and notches (Rogachev et al. 1982:104). The worked bone assemblage contains points, rods, ornamented bones, and tusk fragments (Rogachev and Anikovich 1984:186).

Prut-Dniester

According to Borziac and Kulakovskaya (1998:59) the assemblages from Mitoc Malul Galben sedimentation cycles 7b–6a and Molodova V layers 8–10 belong to the 2nd stage of Gravettian evolution in Central and Eastern Europe. In these assemblages, blank production is based on bidirectional blade core reduction (Otte et al. 1997:280). Toolkits are characterized by points on blades with flat distal and proximal retouch, endscrapers on blades with bases pointed by retouch or by burin spalls, double endscrapers on blades, dihedral burins, burins on oblique truncation, and only rare backed bladelets. Given the rarity of microliths, these assemblages were called macro-Gravettian (Borziac and Kulakovskaya 1998: 59).

Early Gravettian Variability

The difference between the Early Gravettian of the Prut-Dniester region and the "Gravettoid" assemblage of Kostenki 8 layer II is obvious. According to the typological cluster analysis published by Amirkhanov (1998), the Kostenki 8 layer II assemblage is much closer to the Late Gravettian of the Eastern European Plain than to Early Gravettian of Molodova V.

Early Upper Paleolithic Variability

The earliest indication of an Upper Paleolithic in Eastern Europe, probably unassociated with the Middle Paleolithic, is at Buran-Kaya III Level E. This small assemblage (Marks and Monigal 2000a; Monigal, Chapter 4) has a consistent blade technology based mainly on unidirectional prismatic cores. Platforms are small but unfaceted, there is no evidence for striking edge regularization, and blades were seemingly detached by hard hammer. These patterns are vastly different from those seen in the late Crimean Levallois-Mousterian (WCM) but are similar to those used in the Blade Mousterian. The high incidence of truncated-faceted pieces in the Blade Mousterian and their absence in Buran-Kaya III Level E is striking, even with the small sample size. Given the dating of the Blade Mousterian to no later than the Early Glacial and Buran-Kaya III level E to Hengelo, it is most likely that the technological similarities are fortuitous, rather than parts of a single developmental sequence.

Another two assemblages, from Kostenki 14 levels IVa and IVb (Sinitsyn 2000), are also quite early in the Early Upper Paleolithic, with dates greater than 33,000 BP (Table 25-5). These small assemblages reflect a combined flake and blade technology, the tools include various burins on flakes, and a few bone tools were recovered. Without question, they are Upper Paleolithic in our understanding of that term, but there are insufficient samples to place them into an already-named Early Upper Paleolithic industry or to define a new one.

The Streletskaya, Spitsynskaya, Gorodtsovskaya, Aurignacian, and Gravettian Early Upper Paleolithic industries are all strikingly different, with diverse lithic and bone technologies and very specific toolkits. The paucity of Early Upper Paleolithic sites seems to indicate that human populations were quite low, and that they were also highly dispersed. Is the richness and diversity of the archeological cultures related to a new hominid form trying to adapt to new environments?

Middle Paleolithic and Early Upper Paleolithic Human Remains

Before turning to the question of what the variability in these Middle Paleolithic and Early Upper Paleolithic industries means and how it arose, it is necessary to review the skeletal evidence. The human fossil record from Eastern Europe is not nearly as rich as that of Western Europe and it has a number of gaps, as well. No human remains have been found in association with Levallois-Mousterian, Blade Mousterian, or Streletskaya assemblages.

Micoquian Human Remains

The Micoquian is the only Eastern European Middle Paleolithic complex having a clear stratigraphic association with human remains, all of which are Neandertal. While the number of discoveries of human fossils has greatly increased in the past decades, they are all limited to Crimea and the Northern Caucasus and all are chronologically late, dating to between 50,000–30,000 BP.

Parts of 10 different Neandertal skeletons were discovered in Crimea at Kiik-Koba upper and lower levels and at Zaskalnaya VI layers III and IIIa. Both Kiik-Koba Neandertals (adult and juvenile) were buried in pits (Bonch-Osmolowski 1940, 1941, 1954) but it is unclear from which level or levels the pits were dug (Bonch-Osmolowski 1940; Gladilin 1979; Smirnov 1987, 1991; Kolosov et al. 1993). Zaskalnaya VI layer IIIa produced three Neandertal child skeletons. They were found in a pit(s) with no clear borders (Kolosov 1986), but Smirnov (1991) has interpreted it as a "burial structure." Parts of five more child and subadult Neandertal skeletons were also found in layer III (Kolosov 1986; Kolosov et al. 1993). A few adult Neandertal bones were found at Zaskalnaya V layer II and Prolom II layer I produced a phalange (Danilova 1979a, 1979b; Kolosov 1986).

All Crimean human remains associated with the Micoquian were described as Neandertals (Yakimov and Kharitonov 1979), with the exception of the Starosele child (Formozov 1958), which was published as an anatomically modern child. Based upon another two nearby intrusive modern burials at Starosele, it is most likely that the Starosele child is a modern intrusive internment (Marks et al. 1997; Monigal et al. 1998) and certainly not Neandertal, as reported as late as 1996 (Gvozdover et al. 1996).

In the Northern Caucasus, in Barakaevskaya Cave, a mandible and isolated teeth of a young child were found in association with Micoquian deposits (Zubov et al. 1994). Other remains from Northern Caucasus Micoquian assemblages include an isolated tooth from Matuzka Cave layer 5b and isolated teeth and phalanges from Monasheskaya Cave layer 2 (Hoffecker 2002.)

Mezmaiskaya Cave, also in the Northern Caucasus, yielded a partial skeleton in layer 3 associated with a Micoquian assemblage dated to > 45,000 BP. The skeleton of layer 3 was that of an infant or foetus, with an age estimated between 7 months foetal development and 2 months neonate, and appeared to have Neandertal characteristics (Golovanova et al. 1999). No pit was observable around the skeleton (Golovanova et al. 1999), but the very good preservation of the post-cranial material might suggest some intentional (or very fortuitous) protection. A rib of this fœtus/child was later radiocarbon dated to 29,195 ± 965 BP (Ua-14512) and also had a DNA sample extracted from it (Ovchinnikov et al. 2000). Based on the recent *date* Ovchinnikov et al. (2000) suggested that the skeleton was intrusive from the Upper Paleolithic layer 1 (which overlay layer 3 in this portion of the cave). But, the *DNA sequence* left no room for doubt that the infant was much more similar to the Feldhofer Neandertal than to modern humans and concluded that it was, in fact, a Neandertal, and one of the latest-living of them (Ovchinnikov et al. 2000:490).

Spitsynskaya Human Remains

The only human remains associated with the Spitsynskaya is an isolated third molar from Kostenki 17 layer II, which is anatomically modern human (Boriskovski et al. 1982:186; Hoffecker 2002). Layer II is dated to about 26,000 BP (Table 25-6).

Gorodtsovskaya Human Remains

Two burials were found in association with Gorodtsovskaya assemblages: at Kostenki 15 and Kostenki 14. The burial in Kostenki 15 was a 6–7-year-old boy buried in a sitting position. This burial was in a dwelling area and contained some stone and bone tools, including a bone shovel (Rogachev and Sinitsyn 1982b:163). The burial at Kostenki 14 was found below layer III, but its association with that layer is not clear. The burial was of a 25-year-old male in a writhing position (probably tied) (Rogachev and Sinitsyn 1982a:157, 160). The nearly complete skeleton of a neonate was also found at Kostenki 12 layer I (Hoffecker 2002). All of these individuals are anatomically modern (Gerasimova 1982) and date to between 25,000 and 30,000 years ago (Table 25-6)

Aurignacian Human Remains

An isolated molar from an anatomically modern human was found at Siuren I layer 3 during the original excavations of the site (Bonch-Osmolowski 1934). Aurignacian occupations at the site date to ca. 28,000 BP (Figure 25-18). Anatomically modern tibiae, a pelvis, and a tooth have been reported from Kostenki I layer 3 and dated to 26,000 BP (Hoffecker 2002).

Gravettian Human Remains

A number of cranial fragments, probably modern, were found at Kostenki 8 layer 2 and dated to 27,7000 BP. The remains were near a hearth and were heavily burned on their interior surfaces (Rogachev et al. 1982: 108; Hoffecker 2002).

In sum, while the evidence is certainly not overwhelming, it does appear that Neandertals are associated with the Middle Paleolithic and anatomically modern humans with the Upper Paleolithic. On the other hand, the Micoquian lasted over 100,000 years, yet human remains are known only from the end of its span. It should also be stressed that for the most important period of time—from about 36,000 to 28,000 BP—when, at least in Crimea, Middle Paleolithic (Levallois-Mousterian at Kabazi II, Kiik-Koba at Buran-Kaya III) and Upper Paleolithic (Streletskaya at Buran-Kaya III, Aurignacian at Siuren I) peoples apparently co-existed, there are no associated human remains other than the tooth found at Siuren I during the 1930s.

While anatomically modern humans are known to have been in the Levant by 100,000 years ago, they apparently did not reach Eastern Europe until after 30,000 BP. Physically adapted to southerly tropical climates (Trinkaus 1981), these modern humans arrived during the later OIS 3 and dispersed into the periglacial loess steppes, then into the taiga before subsequently expanding throughout the Eastern Europe. It is widely assumed that these hominids first colonized "empty niches" that had been abandoned by Neandertals (Hoffecker 2002:188), but given that there is such a dearth of fossil remains and that we have no way of knowing who was responsible for many of the cultural remains during this period, such assumptions must be treated with caution.

The Evolution of Middle and Early Upper Paleolithic in Eastern Europe

In spite of the wide geographic distribution of the Micoquian in Eastern Europe, its relative stratigraphic position in the Middle Paleolithic is not uniform. In the Prut-Dniester Basins, the Micoquian always overlies the Levallois-Mousterian, as in Central Europe, where the Micoquian overlies Levallois and/or blade industries (Conard 1992; Tuffreau 1993; Kulakovskaya 1999). In Crimea and the Donbass-Azov regions, however, the Levallois-Mousterian and Blade Mousterian normally overlie Micoquian occupations, although contemporaneity of the two is chronologically demonstrable in Crimea (Figures 25-17 and 25-18).

In Central Europe, there is no Micoquian dated to the Last Interglacial or before (Richter 1997, 1999; Conard and Fischer 2000), while at least two Micoquian assemblages in Eastern Europe are firmly dated to the Last Interglacial. When it is considered that Crimea was probably an island during the Last Interglacial, the Crimean Last Interglacial Micoquian must have been present before the Black Sea transgression (Figures 25-3 and 25-17). Thus, the idea that Central Europe was the core region for Micoquian expansion to the east (Gladilin 1976, 1985) can no longer be supported. At the same time, there is no specific evidence to postulate a western expansion from Eastern Europe beyond the vagaries of present archeological knowledge. Given the presence of the diagnostic Micoquian plano-convex tool production in association with a paucity of blade production, and a common use of ventral thinning in several Western European sites dated to the Middle Pleistocene (e.g., Marks et al. 2002), it is certain that both the meaning of what we call Micoquian and its origin(s) still elude us (Ronen and Weinstein-Evron 2000). The present knowledge of Eastern European Middle Pleistocene industries (Kolosov et al. 1993; Golovanova 1994; Liubine 1998; Sytnyk and Boguckyj 1998; Sytnyk 2000) is far too tentative to suggest a reliable local

kyr BP	*OIS*	*Chronostratigraphy*		*Micoquian* Prut-Dniester	*Micoquian* Crimea	*Micoquian* Northern Caucasus	*Micoquian* Donbass	*Micoquian* Lower Volga	*Levallois-Mousterian* Prut-Dniester	*Levallois-Mousterian* Crimea	*Blade Mousterian* Donets-Don
40		Hengelo	2nd Period	Ripiceni-Izvor, V	Starosele, 1, 2					Kabazi II, II8-IIA/1	
50	3	stadial	2nd Period	Ripiceni-Izvor, IV	Zaskalnaya V, III Zaskalnaya V, IV Kabazi II, IIA/2-3 Chokurcha I, IV	Monasheskaya, 2-4 Barakaevskaya Mezmaiskaya, 2B-1,2 Mezmaiskaya, 2B-3; 3				Kabazi II,IIA/2	▲
60	3	Moershoofd	1st Period		Kabazi V, II/3-II/4A Kabazi II, IIA/3-IIA/4B	▲			Ripiceni-Izvor, III Molodova V, 11a		
70	4	stadial	1st Period		Kabazi V, III/1-III/3 Kabazi II, III/1A-III/1						Shlyakh, 8C Belokuzminovka, 3 Zvanovka
80	5a	Odderade?	1st Period		Starosele, 4 Kabazi II, III/2	Ilskaya I			Ripiceni-Izvor, II		
90	5b		1st Period						Molodova I, 4 Molodova V, 11		Kurdumovka
100	5c	Brörup?	1st Period		Zaskalnaya V, V				Molodova V, 12 Ripiceni-Izvor, I		
110	5d	Amersfoort?	1st Period	Yezupil, II Kolodiev, 12.5–12.9	Kabazi II, III/2A-III/7	▼	Nosovo I Antonovka II Antonovka I ▼	Sukhaya Mechetka ▼	Proniatin Igrovitsa I, II Bugliv V, II		Belokuzminovka, 2
120	5e	Eem			Kabazi II, V/3-VI/17		Belokuzminovka, 1	Cheluskinets ?	Yezupil, III		

Figure 25-17—The chronological position of assemblages belonging to the 1st (Early) and 2nd (Middle) Periods of the Eastern European Middle Paleolithic.

ancestor for the Micoquian complex, if such ever existed in Eastern Europe. From wherever and out of whatever it developed, present evidence from Eastern Europe, at least, indicates it was made by Neandertals. Yet, all associations come from Micoquian sites in Crimea and the Northern Caucasus that post-date 50,000 BP.

Unlike the Micoquian, the Last Interglacial Levallois-Mousterian of the Prut-Dniester Basins might have originated in Central Europe, since, on the other side of the Carpathian Mountains at Korolevo, there are numerous Rissian-age Levallois-Mousterian assemblages (Gladilin and Sitlivy 1990). There is no indication, at all, of a possible progenitor for the Blade Mousterian. Since there are no hominid fossils associated with either industry, their creators remain unknown.

From the Early Glacial to the Moershoofd Interstadial, Micoquians populated Crimea, while in the Azov-Donbass and Prut-Dniester resident Micoquians shared their areas with makers of the Blade Mousterian and Levallois-Mousterian, respectively (Figures 25-4 and 25-17). After the Moershoofd Interstadial, the Levallois-Mousterian sequence in Prut-Dniester region ends and comparable assemblages are found in Crimea (Figures 25-5 and 25-17). Is this evidence of migration? Perhaps. If so, this population movement might have been caused by harsh climatic conditions in the Prut-Dniester region that are seen after Moershoofd in the Molodova V sequence and also, throughout Poland during OIS 4 and 3 (Madeyska 1996). According to J. Kozlowski (2000b:90), there are two "hiatuses" in the human occupation of southern Poland, corresponding to the Early Pleniglacial and the first stadial of the Middle Pleniglacial. Unlike southern Poland, where Micoquian disappeared before the maximum of the Early Pleniglacial (OIS 4) (Kozlowski 2000b:77), the Micoquian in the Prut-Dniester region replaced Levallois-Mousterian at the beginning of OIS 3. Also, after the Moershoofd began, the first well documented appearance of the Micoquian in the Northern Caucasus is found and both Micoquian and Levallois-Mousterian occur in Crimea (Figures 25-5 and 25-17). Thus, the climatic deterioration during the Early Pleniglacial (OIS 4) may have caused population movements toward balmier southern climes. Seemingly, the onset of OIS 3, the Middle Pleniglacial, was a time of changes in Eastern Europe, as everywhere in Europe (Gamble and Roebroeks 1999).

While the Micoquian and the Levallois-Mousterian were both in Crimea at the same general time, the

Levallois-Mousterian seemed to have had a quite different settlement strategy than that of the already established Micoquians (Marks and Chabai 2001). Most striking is the apparent ephemeral nature of virtually all Levallois-Mousterian (Western Crimean Mousterian) occupations, which might argue for a highly mobile settlement system consistent with long distance movements. While comparably ephemeral and short-term Micoquian occupations existed (Chabai 1998d; Yevtushenko et al., Chapter 15), many Micoquian sites indicate a certain degree of occupational stability, with a wide range of economic and social activities (Chabai et al. 1999), including secondary butchering (Burke 1999a, 1999b), purposeful on-site burials, buried artifact caches, fireplace structures, etc. (Marks and Chabai 2001). In spite of this difference, both the Micoquian and the Levallois-Mousterian populations mainly exploited the same range of steppe megafauna, regardless of the availability of forest species during interstadials (Burke, Chapter 16; Patou-Mathis, Chapter 22). Thus, while present evidence now clearly places the Levallois-Mousterian (Western Crimean Mousterian) in both western and eastern Crimea (Yevtushenko, Chapter 20), they apparently utilized quite different settlement systems to exploit the same range of animals as those exploited by the contemporary Micoquian.

Since Crimea is quite small, the apparent contemporaneity of the Levallois-Mousterian with, at least, the post-50,000 year old Micoquian, raises the issue of possible contact and interactions between them. At least one site, Zaskalnaya V (Chabai 2000a), provides some evidence for possible interstratification of Levallois-Mousterian and Micoquian occupations. Comparable absolute dates and such interstratification do not and cannot demonstrate any actual contacts. After all, the time involved is in the order of 20,000 years and even at a recurrently occupied and reoccupied site, such as Zaskalnaya V, the probability of anyone being there on any given day in that 20,000 year period must have been exceedingly small. Evidence *against* meaningful contact—contact that resulted in some archeologically visible modification of an existing behavioral pattern—can be found in the homogeneity and marked continuity of the Micoquian technological and typological proclivities from the Last Interglacial until post-30,000 BP. In addition, whatever contact might have occurred between the Levallois-Mousterian populations and the Micoquian populations led to no archeologically visible changes in Levallois-Mousterian patterns. The settlement system did not change and, while technological change did take place, it did not reflect an adoption of Micoquian technological patterns. If anything, the technological changes within the Levallois-Mousterian were totally foreign to Micoquian technology.

The appearance of Early Upper Paleolithic assemblages in the western (Prut-Dniester) and central (Mid Don) regions of Eastern Europe during the stadial preceding the Denekamp (Arcy) Interstadial was a major event (Figures 25-6 and 25-18). They appeared while Middle Paleolithic peoples still inhabited Crimea and the Northern Caucasus and, seemingly, their presence had little initial effect on the Micoquian residents. This may relate to Early Upper Paleolithic choice of settlement locations. The Mid Don Early Upper Paleolithic Spitsynskaya from Kostenki 17 layer II was associated with humid forests of northern taiga type (Malyasova and Spiridonova 1982:237). There is no reason to believe that Streletskaya occupations of about the same time and same area existed in different environments: they both appear to have been limited to the taiga forest. The Micoquian, on the other hand, at this time were distributed mainly in the forest-steppe environments of Crimea and the Northern Caucasus. Later, at the end of the same stadial and then after Denekamp (Arcy), the Streletskaya appears to have spread into the steppe environment of Crimea and the Lower Don, as well as during some unknown time into the northern latitudes of the Northern Urals (Guslitzer and Pavlov 1993).

The Streletskaya adaptation to open steppe landscapes coincides with changes in arrowhead typology. The heavy bifacial triangular arrowheads useful in the forested landscapes of the taiga were augmented by light, bifacially retouched micro-points and trapezoids. The connection between the Mid Don and Crimea was geographically determined by the Black Sea basin regression, which caused the disappearance of Azov Sea. In such situations, the eastern Crimean rivers (tributaries of Salgir, etc.) became the tributaries of the Don River.

After 30,000 BP (during Lower Humic Bed deposition), the Mid Don region was visited by another taiga adapted group—the Gorodtsovskaya (Figures 25-7 and 25-18). At least two Gorodtsovskaya assemblages, from Kostenki 14 layers II and III, are associated with forested landscapes, which were not as humid or cold as at Kostenki 17 layer II, but still of taiga type (Malyasova and Spiridonova 1982: 244). The Gorodtsovskaya has a relatively "primitive" lithic technology, but shows an incredibly developed and variable bone industry, adornments, burial customs, and dwelling structures for that period.

The first appearance of the Aurignacian in Eastern Europe is documented at the end of the preceding stadial and beginning of the Denekamp (Arcy) Interstadial in the Prut Valley. There is also evidence for the Aurignacian during the Denekamp (Arcy) in Crimea and, at the end or after the Denekamp (Arcy), in the Mid Don (Figures 25-6, 25-7, 25-18). Thus, the Aurignacian was not contemporaneous with the other non-Aurignacian Early Upper Paleolithic, but

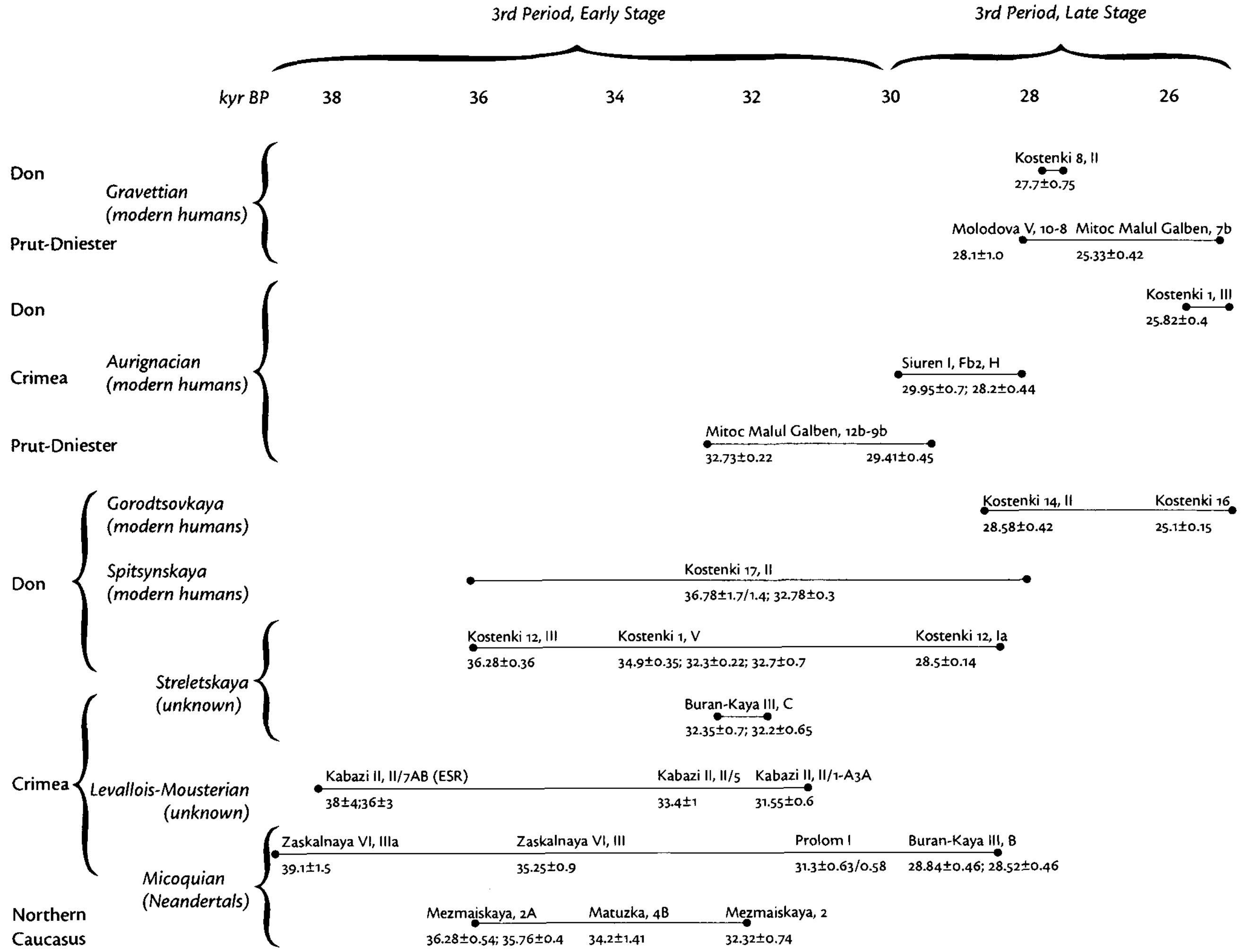

Figure 25-18—The chronological position of assemblages belonging to the 3rd (Transitional) Period of the Eastern European Paleolithic.

it co-existed with the Crimean Micoquian. The first documented Aurignacian "visit" to Crimea and the Mid Don was after the Streletskaya, Spitsynskaya and, at least, after the first manifestation of the Gorodtsovskaya. The appearance of the Aurignacian in the Mid Don was connected to environmental changes that took place after the deposition of the Upper Humic Bed. The pollen samples from loess deposited above the Upper Humic Bed show open forest-steppe/steppe-desert landscapes in the Mid Don area. Therefore, the Eastern European Aurignacian is only associated with open landscapes; the same kind of landscapes exploited by the Middle Paleolithic population. The Aurignacian exploitation of the "Don Passage" between the Kostenki-Borshchevo area and Crimea is documented by Black Sea shells found in Kostenki 1 layer III (Hahn 1977: 144).

The appearance of the Gravettian in the Prut River basin and "Gravettoid" industries in the Mid Don around 28–27,000 BP (Figures 25-7 and 25-18) marks the beginning of the end of incredible environmental, technological, typological, and adaptive variability in Eastern Europe. There is no documented evidence for Middle Paleolithic or Spitsynskaya assemblages after 28,000 BP and none for the Gorodtsovskaya after the Denekamp (Arcy). Only the Streletskaya survives to the end of the Denekamp (Arcy) Interstadial at Birioutchaya Balka 2 layer 3.

A number of Middle Paleolithic and Early Upper Paleolithic complexes, such as Levallois-Mousterian, Micoquian, Aurignacian, and Gravettian, demonstrate environmental and technological affinities with the same or similar complexes of Central Europe. On the other hand, the environmental context, and the stone and bone technologies of the Spitsynskaya, Streletskaya, and Gorodtsovskaya have nothing common with Central European or local Middle Paleolithic predecessors or contemporaries (Gladilin and Demidenko 1989). At the same time, at least two of them are associated with anatomically modern humans (Figure 25-18). It is most likely that during the 3rd Period, the Eastern European Plain was populated by modern humans in two environmentally different regions: the East European belt of taiga forests and the forest-steppe zone of eastern Central Europe. The Central European modern human "invaders" seemingly exploited the same environment as did the local Neandertals.

The coexistence of Aurignacian and Micoquian in Crimea resulted in no archeologically or anthropologically visible interactions. In addition, there is no evidence for influence on the local Middle Paleolithic of the contemporaneous taiga people. In fact, they may never have come into contact with one another, since they chose to live in different environments.

Thus, there are two core regions for modern human dispersal in Eastern Europe: the Central European belt of forest-steppe/steppe and the taiga forest belt of Eastern Europe and/or Asia. The Eastern European model of a "Transitional Period" is based on a two-step scenario. First, between the Hengelo and Arcy, modern humans adapted to the taiga belt mainly populated the northern part of the Eastern European Plain. During that time, Middle Paleolithic and Early Upper Paleolithic populations coexisted in environmentally different regions. Second, during the Denekamp (Arcy) Interstadial, modern humans from Central Europe followed the steppe expansion, replacing the local Middle and Early Upper Paleolithic peoples. After the Denekamp (Arcy), the Eastern European Plain became Gravettian, while in Crimea, an archeological hiatus occurs until Epi-Gravettian industries appeared around 18–17,000 BP.

The primary reason for composing syntheses of this nature is to place a localized, yet very detailed, Paleolithic sequence (in this case, Crimea) into its larger geographical context (in this case, Eastern Europe). In doing so, one is necessarily confronted with the maddeningly patchy database for paleoenvironments, absolute and relative dating, and lithic assemblages. With the desire of comparing a single, tiny region to continent-wide adaptations to ever-changing environments, and the variations in lithic, landscape, resource, and time use, one is invariably forced to gloss over the gaps in data or the details of, for example, typological variation. Obviously, to attempt to discuss continuity or replacement of the rich lithic industries associated with Neandertals and anatomically modern humans on such a massive, almost continent-wide scale is simplistic and not at all testable. Yet, to not do so would be to marginalize an area like Crimea—an area that was continuously inhabited throughout the Late Pleistocene due to its southerly location, easy accessibility from the west, north, and east during most of this time, and was a highly desirable, refugia-like environment—for flora, fauna, and humans—when most of Eastern Europe was cold, harsh, and shelterless.