The chronological and industrial variability of the Middle to Upper Paleolithic transition in eastern Europe

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ABSTRACT  In Eastern Europe, during the period from about ca.36 000 to ca.28 000 BP, two Middle Paleolithic industries, the Western Crimean Mousterian and the Eastern Micoquian, coexisted with a number of early Upper Paleolithic complexes: the Eastern Szeletian; the Streletskaia, Gorodtsovskaya and Spitsynskaya “cultures”; and the Aurignacian of Krems-Dufour type. This coexistence is demonstrated by the AMS chronology, as well as by the stratigraphic sequences of the Buran-Kaya III and Siuren I sites. Neandertals were responsible for the late Middle Paleolithic industries until ca.28 000 BP. The appearance of anatomically modern humans is dated to ca.36-32 000 BP, in association with such specific Upper Paleolithic stone and worked bone assemblages as the Spitsynskaya and Gorodtsovskaya “cultures”, not the Aurignacian. No reliable evidence exists for any kind of interaction between any of these industries, and no data suggest generic links between the Middle and the early Upper Paleolithic of the region.

Introduction

In spite of the great number of Middle and early Upper Paleolithic industries traditionally cited in transitional studies concerning Eastern Europe (Anikovich, 1992; Cohen and Stepanchuk, 1999, 2000), those strictly connected to this problem are not so numerous. They are the late Middle Paleolithic Eastern Crimean and Moustierian industries of Crimea and the northern Caucasus, and the EUP industries along the middle Don River and in the Crimea represented by the Streletskaia, Spitsynskaya and Gorodtsovskaya “cultures”, as well as the Krems-Dufour variant of the Aurignacian. All of these coexisted from about ca.36 000 to ca.28 000 BP.

From the point of view of interpleniiglacial geography, all of them were found in an ancient Don River basin, which includes the Don’s Crimean and northern Caucasus tributaries (Fig. 1). This geographical setting was determined by Upper Pleistocene fluctu-
Western Crimean Mousterian: Kabazi II, horizons II/1 (2, 4-6, 8), II/6 (1, 3, 7, 10), II/7 (9, 11), II/7AB (13-14), II/7C (12). Points (1-2, 6-7); scrapers (3-4, 9-10, 14); blades, backed (5) and laterally retouched (11); cores (8, 12-13).
ations of the Black Sea. Even during periods of transgression, the sea basin was about 30 m lower than at present (Alekseev et al., 1986). At the same time, the climatic conditions reconstructed for Crimea and the middle Don Valley were quite different. From about 36 000 to 28 000 BP, which corresponds with the Les Cottès and Arcy (Denekamp) interstadials and intervening stadial, the Crimean foothills were covered by moderately cold forest-steppe and steppe vegetations, while the Middle Don Valley was characterized by a zone of arctic-boreal taiga forests (Malyasova and Spiridonova, 1982; Gerasimenko, 1999).

Western Crimean Mousterian

The chronology of the late Western Crimean Mousterian is based on a number of AMS and ESR dates from Kabazi II, levels II/1A through II/7E (Fig. 2). According to pollen studies, these levels correspond with the climatic conditions of the Les Cottès interstadial and the following stadial (Gerasimenko, 1999). Western Crimean Mousterian assemblages are always superimposed on the Micoquian in the stratigraphic sequences of Crimean sites. There is no evidence of any stratigraphic contemporaneity between the Western Crimean Mousterian and EUP assemblages.

The Western Crimean Mousterian exhibits a complete absence of bifacial technology. The primary flaking was based on blade production from single and opposed platform cores. Some true blade cores were exploited volumetrically (Fig. 2, no. 8, 12-13), and crested blades and core tablets were used for core shaping. Blades represent about 35% of all blanks in each assemblage (Chabai, 1998a, 1998b).

The typological structure of the tool assemblages is as follows: points (about 20% of the tool-kit), scrapers (60-70%) and denticulates (about 10%). Upper Paleolithic tool-types (Fig. 2, no. 5) and notches are both uncommon. The simple sidescrapers (Fig. 2, no. 4), sometimes naturally backed (Fig. 2, no. 3, 10, 14), make up about 80% of the scrapers, while double sidescrapers (Fig. 2, no. 9) are rare. Point types are mainly leaf-shaped (Fig. 2, no. 2), semi-crescent (Fig. 2, no.6-7), or obliquely retouched (Fig. 2, no.1).

Thus, the core reduction strategy could be characterized as being of Upper Paleolithic mode, although hard hammer, while the typological structure of tool assemblages is clearly Middle Paleolithic (Chabai, 2000a).

There are no known human remains associated with Western Crimean Mousterian assemblages.

Eastern Micoquian

Based on a number of AMS and ESR dates, the late Eastern Micoquian in the Crimea and the northern Caucasus lasted until about 28 000 to 34 000 BP (Fig. 3). In the Siuren I deposits, Micoquian tool-kits were found in the same levels with the Aurignacian (Demidenko et al., 1998). The mixture of Aurignacian and Micoquian assemblages at Siuren I, Units H and G, was caused by alternating visits of Micoquian and Aurignacian inhabitants on the same occupation surfaces (Demidenko, 2000). In the Buran-Kaya III stratigraphic sequence, level B, with a Micoquian assemblage, clearly overlies the Upper Paleolithic “Eastern Szeletian” industry of level C (Marks, 1998).

Technologically, the Eastern Micoquian industries are based on the plano-convex manner of bifacial tool production and parallel primitive and/or radial core reduction strategies.
FIG. 3 – Eastern Micoquian: Buran-Kaya III, level B (1-7), Mezmaiskaya, layer 2A-2 (8-10, 12, 14-15) and Matuzka, layer 4B (11, 13) (redrawn from Yamada, 1996 and Golovanova and Hoffecker, 2000). Points (1-3, 5, 7, 13); bifacial point (4); scrapers (6, 9-12, 14-15); bifacial backed scraper (8).
Blades are uncommon. The tool-kits of these industries are characterized by similar types: bifacial points and bifacial scrapers (5-20%), points (5-10%), simple sidescrapers (30-50%), different types of convergent scrapers (20-40%). The points (Fig. 3, no. 1-3, 5, 7, 13-14) and convergent scrapers (Fig. 3, no. 6, 9-12, 15) tend to be canted (off-axis) and have different kinds of ventral thinning. The most common bifacial forms are leaf shaped points (Fig. 3, no. 4), scrapers and naturally backed “knives” (Fig. 3, no. 8), resembling Prondnik and/or Klausen-nishe types. Upper Paleolithic tool-types (endscrapers, burins, perforators, etc.) are very rare and mostly atypical (Kolosov, 1983, 1986; Yamada, 1996; Golovanova and Hoffecker, 2000).

The Eastern Micoquian, both in the Crimea and the northern Caucasus, is associated with Neandertals. Except for the problematic burial in Mezmaiskaya, layer 3 (Ovchinnikov et al., 2000), the Neandertal remains all were found in a clear stratigraphic position; such is the case with Mezmaiskaya, layer 2, and Zaskalnaya VI, layer IIIa (Kolosov, 1986; Smirnov 1991; Golovanova and Romanova, 1995; Golovanova and Hoffecker, 2000). The most recent one is dated to ca.30-39 000 BP (Fig. 3).

**Eastern Szeletian**

Stratigraphically, the Eastern Szeletian at Buran-Kaya III, level C, lies below the Eastern Micoquian assemblage of level B (Marks, 1998). Buran-Kaya III, level C, dates to ca.32 000 BP (Fig. 4). There is no evidence for any reduction strategy other than bifacial (Marks, 1998). Unlike the Eastern Micoquian, where only the plano-convex method of reduction was used, the inhabitants of level C produced thin bifacial foliates in a bi-convex, Upper Paleolithic manner (Marks, 1998). The typological structure of the level C assemblage is characterized by bifacial foliates (Fig. 4, no. 2-3), endscrapers on laterally retouched flakes (Fig. 4, no. 1-4), retouched pieces, and the most peculiar category of artifact — bifacially retouched trapezoid microliths (Fig. 4, no. 8-15) (Marks, 1998; Marks and Monigal, 2000a, 2000b). In general terms, the trapezoids are subdivided into two types: with straight base (Fig. 4, no. 8-10) and with concave base (Fig. 4, no. 11-15) (Chabai, 2000b). In addition, a few clearly worked bones — “bone tubes” (Fig. 4, no. 6-7) — were identified (Yanevich et al., 1997; d’Errico and Laroulandie, 2000).

No human remains were found in association with this Eastern Szeletian assemblage.

**Streletskaya “culture”**

The Streletskaya assemblages (Fig. 4) belong to the Kostenki Ancient Chronological Group, which is dated to between 36 000 and 32 000 BP, and to the Kostenki Middle Chronological Group, which is dated to between 32 000 and 27 000 BP (Sinitsyn et al., 1997). There is some evidence for a stratigraphic correlation of Streletskaya and other Kostenki EUP assemblages. Streletskaya assemblages always underlie Gorodtsovskaya and Aurignacian assemblages. At Kostenki 12, the Streletskaya assemblages were found in layers III and Ia, while the Gorodtsovskaya industry was identified in the uppermost layer I (Rogachev and Anikovich, 1982c). At Kostenki 1, the Streletskaya assemblage was found in the lowermost layer V, while an Aurignacian assemblage was found in layer III (Rogachev et al., 1982).

The technology of the Streletskaya industry was based on the production of thin bifaces, biconvex in cross-section, and on cores with discoidal and parallel, non-volumetric flaking surfaces (Rogachev and Anikovich, 1984; Bradley et al., 1995). The tool-kit consists of bifacial triangular points with concave bases (Fig. 4, no. 17-21), bifacial triangular micro-
FIG. 4 – “Eastern Szeletian” from Buran-Kaya III, level C (1-15) (redrawn from Marks, 1998). Streletska “culture” from Kostenki 1, layer V (16-19, 22-23) and Kostenki 12, layer III (20) (redrawn from Rogachev and Anikovich, 1984). Endscrapers (1, 4, 15-19, 22-23); bifacial leaf-shaped points (2-3); bifacial points with concave base (16-17, 21); bifacially retouched trapezoids with straight (8-10) and concave (11-15) bases; core (5); fragment of bifacially retouched flint plaquette (20); bone artifacts (6-7).
points with concave bases (Fig. 4, no. 16), bifacial leaf-shaped points, bifacial “knives” with a single retouched edge made on flint plaquettes (Fig. 4, no. 20), as well as endscrapers on flakes with expanding retouched edges and thinned bases (Fig. 4, no. 18-19, 22-23). The numbers of bifaces and endscrapers are approximately equal. Together, bifacial tools and endscrapers account for about 60% of tools. Other tool-types, especially burins, are rare. Also, there is a small Middle Paleolithic component: Mousterian points and sidescrapers (Rogachev and Anikovich, 1982a, 1982b, 1982c). At the same time, according to E. Giria, the so-called Middle Paleolithic bifacial tools are, in fact, unfinished thin triangular and foliate bifaces. That is, in this view, there was no Middle Paleolithic and/or transitional technology in the Streletsksaya “culture” assemblages (Giria, 1999).

There are some parallels between the technology of bifacial tool production in the Streletsksaya “culture” assemblages and the Buran-Kaya III, level C, assemblage (Marks and Monigal, 2000). Also, the technology of the Buran-Kaya trapezoids (Fig. 4, no. 8-15) resembles to some extent the Streletsksaya micropoints (Fig. 4, no. 16) (Chabai, 2000b).

There are no bone tools in Streletsksaya “culture” assemblages, and no human remains have been found in association with this “culture.”

**Spitsynskaya “culture”**

The Spitsynskaya assemblage occurs in the Kostenki Ancient Chronological Group, 36 000 to 32 000 BP (Sinitsyn et al., 1997). This assemblage was found at Kostenki 17, Layer II (Boriskovski et al., 1982). The typological definition of Kostenki 12, Layer II, is not clear (Rogachev and Anikovich, 1982c). If it is really associated with the Spitsynskaya “culture”, it might be the only evidence of a stratigraphic correlation with the Streletsksaya “culture”: Kostenki 12, Layer II, is situated stratigraphically between the Streletsksaya assemblages found in Layers III and Ia.

The only technology recognized for the Spitsynskaya “culture” is the production of blades based on the exploitation of parallel “prismatic” single (Fig. 5, no. 13) and double platform cores with volumetric flaking surfaces.

The endscrapers (3-7% of the total tool number) are represented by ovoid pieces, made on flakes with retouched edges (Fig. 5, no. 3-4), and by simple endscrapers on blades (Fig. 5, no. 1-2). Burins are the main class of tools (about 48% of the tool-kit). There are burins on oblique truncations (Fig. 5, no. 6, 8-9, 12), double opposed burins on oblique truncations or “parallelograms” (Fig. 5, no. 5, 7), according to P. Boriskovski, dihedral burins (Fig. 5, no. 10) and angle burins. The majority of burins were made on oblique truncations (Boriskovski et al., 1982). There are some scaled pieces (about 5%) as well as a few non-geometric microliths (four, about 1.2% of the tools, three of them backed microblades and/or bladelets). The rest of the tools are represented by a few pointed blades and simple retouch flakes and blades.

Bone and ivory tools are characterized by awls made on hare or arctic fox humeri (Fig. 5, no. 21). Also, there are fragments of bone points and fragments of worked mammoth tusk (Fig. 5, no. 22).

Personal adornments are represented by pendants made on arctic fox teeth, stone, belemnite, shells, and fossil corals (Fig. 5, no. 14-19). According to S. A. Semenov, the holes in the teeth and stone were made by drilling, but without any indication of a bow drill (Boriskovski et al., 1982, p. 186).

The only human remain is a third left molar which is anatomically modern (Boriskovski et al., 1982, p. 186).
FIG. 5 – Spitsynskaya "culture": Kostenki 17, layer II (redrawn from Boriskovsky et al., 1982). Endscrapers (1-4); burins (5-12); core (13); adornments made on shell (14), teeth (15-16) and stone (17-20); awl (21); worked mammoth tusk (22).
The assemblages of the Gorodtsovskaya “culture” fall into the Kostenki Middle Chronological Group, which is dated to between about 32,000 and 27,000 BP (Fig. 6) (Sinitsyn et al., 1997).

Primary flaking technology of both flakes and blades was based on unsystematic and parallel cores. The latter usually exhibit a volumetric flaking surface. Bifacial tools are rare and not standardized (Rogachev and Sinitsyn, 1982a, 1982b; Sinitsyn, 1996).

Endscrapers are the dominant class of tools (about 45%). The shapes of endscrapers and their methods of elaboration vary considerably. In general, endscrapers have been subdivided into those with parallel edges (Fig. 6, no. 7-9), and those with expanding edges (Fig. 6, no. 2-6, 10). The endscrapers with expanding edges tend to be fan-shaped. The endscrapers with parallel edges were made on blades and elongated flakes, while the endscrapers with expanded edges were made on flakes. The most common type of endscrapers with parallel edges is a thick endscraper with edges modified by abrupt scalar retouch (Fig. 6, no. 7-8). The most specific type is the fan-shaped endscraper, often with a pointed base (Fig. 6, no. 2-4, 6) and different kinds of ventral thinning. Also, double endscrapers with retouched lateral edges are common. According to A. N. Rogachev and A. A. Sinitsyn, these are morphologically close to limaces (Fig. 6, no. 1), which are also present in the Gorodtsovskaya assemblages. Scaled pieces are common (about 28%) and represented by a relatively wide variety of shapes (Fig. 6, no. 12-19). Burins are rare (Rogachev and Sinitsyn, 1982a, 1982b; Sinitsyn, 1996).

Middle Paleolithic type tools (about 20%) include sidescrapers, transversal scrapers, canted and double canted scrapers (Fig. 6, no. 21), convergent scrapers (Fig. 6, no. 11), points (Fig. 6, no. 20, 25) and limaces (Fig. 6, no. 1). Convergent scrapers and points often exhibit different kinds of ventral thinning (Fig. 6, no. 20). Bifacial tools are rare (Fig. 6, no. 22). At the same time, A. Sinitsyn noted that Mousterian tools “have the same kind of retouch and were made in the same way as other unquestionably Upper Paleolithic types of tools” (Sinitsyn, 1996, p. 283).

The bone and ivory tool assemblage is characterized by a striking variety of shapes: “shovels” with nail-like heads made on mammoth long bones (Fig. 7, no. 7, 21-22); points of different types, including needle-like ones (Fig. 7, no. 8-15). The shafts of the shovels (Fig. 7, no. 7), the bone points (Fig. 7, no. 12) and the bone tube fragments (Fig. 7, no. 17-19) were decorated with complex bands of geometric incisions. Also, there are some bone retouchers (Fig. 7, no. 16) and “polishers” (Fig. 7, no. 20) (Rogachev and Sinitsyn, 1982a, 1982b; Sinitsyn, 1996). Three types of pendants are known: decorated bird bones (Fig. 7, no. 6), as well as stone and bone items (Fig. 7, no. 1-5) with drilled holes.

Two burials and one dwelling structure were found in association with the Gorodtsovskaya “culture”: the burial at Kostenki 15 and, probably, that at Kostenki 14. At Kostenki 15, the burial was in a dwelling area: a 6-7 year old boy was buried in a sitting position. Some bone and stone artifacts were associated with this burial (Rogachev and Sinitsyn, 1982). The burial at Kostenki 14 was found below layer III, but its association with the layer III living floor is not clear. The burial contained a 25 year old male buried in a “writhing” position. Probably, he was tied. In spite of a number of speculations about its racial type, both are clearly modern humans (Gerasimova, 1982).
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FIG. 6 – Gorodtsovskaya “culture”: Kostenki 12, layer I (14-15); Kostenki 14, layer II (1-2, 4-12, 18, 21-25); Kostenki 15 (3, 13, 16-17, 19-20) (redrawn from Rogachev and Sinitsyn, 1982a, 1982b, and Rogachev and Anikovich, 1984). Limace (1); endscrapers (2-10); scrapers (11, 21); scaled pieces (12-19); bifacial tool made on a scaled piece (22); points (20, 25); cores (23-24).

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FIG. 7 – Gorodtsovskaya “culture”, bone industry: Kostenki 14, layer II (1-20); Kostenki 15 (21-22) (after Rogachev and Sinitsyn, 1982a, 1982b); pendants (1-6); decorated handle with nail-like head (7); awls (8, 14); needles (9, 15); points (10, 13); decorated point with zoomorphic head (12); retoucher (16); decorated bone pieces (17-19); “polisher” (20); “shovels” on long mammoth bones with nail-like heads (21-22).
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FIG. 8 – Aurignacian: Siuren I, horizons H (1-3, 6-7, 10-11), Gd (23), Gct-Gc2 (4-5, 8-9, 14, 22), Fbt-Fb2 (12-13, 15-21) and Kostenki 1, layer III (24-38) (after Hahn, 1977). Krems points (1-5, 24, 26-28); Dufour microblades and bladelets (6-11, 29-32) and pseudo-Dufour microblade (25); endscrapers, thick shouldered (12-13, 37), carinated (14, 15, 17, 34); on flake with bilateral retouch (23); carinated cores (16, 19); carinated burins (15, 17, 20, 33, 36); endscaper/carinated burin (18); blades with Aurignacian retouch (22, 35); point made on a mammoth tusk fragment (35).
Aurignacian

The Crimean Aurignacian from Siuren I, units H, G and F, was identified as the Krems-Dufour variant of Aurignacian (Demidenko et al., 1998). The determination of its chronological position at Siuren I — 29,000 to 28,000 BP — is based on a series of AMS dates (Fig. 8).

Technologically, the Siuren I Aurignacian assemblages are characterized by a pronounced bladelet and microblade component. Altogether, they comprise about 40-50% of the total number of blanks. True blades account for <20%. The bladelets and microblades are associated with carinated endscrapers, burins and cores (Fig. 8, no.16, 19), which dominate the core assemblage.

The Dufour (Fig. 8, 6-11) and pseudo-Dufour bladelets and microblades comprise about half of the tool-kit. A few points of Krems type (Fig. 8, no. 1-5) were also identified. The other characteristic types of Aurignacian tools were also found: retouched blades (Fig. 8, no. 22), carinated endscrapers (Fig. 8, no. 14, 21) and burins (Fig. 8, no. 15, 17-18, 20), thick nosed and thick shouldered (Fig. 8, no. 12-13) endscrapers. Bone points and awls, as well as pendants on marine shells, are common in the Siuren I Aurignacian assemblages (Demidenko et al., 1998).

Human remains are represented by a single molar from an anatomically modern human (Bonch-Osmolowski, 1934).

The Aurignacian in the middle Don Valley at Kostienki 1, layer III, is dated to about 25,000 BP (Fig. 8). Placing it into the Kostenki Middle Chronological Group (Sinitsyn et al., 1997) is more a reflection of traditional views on the regional chronology at Kostenki-Borschevo than a reflection of its genuine age. In the Kostienki 1 stratigraphic sequence, the Aurignacian assemblage is situated above the Streletskaya (layer V) industry.

The Aurignacian assemblage at Kostienki 1, layer III, is based on a microblade technology. The cores for these microblades account for about 50% of all cores. The most common tool-types are Dufour (Fig. 8, no. 29-32) and pseudo-Dufour microblades (Fig. 8, no. 27): about 50% of the tool-kit. Also, a number of Krems points (Fig. 8, no. 24, 26-28) are known from this assemblage. The endscrapers represent about 20% of the tool assemblage. One third of them are thick, including carinated (Fig. 8, no. 34) and shouldered (Fig. 8, no. 37) examples. Burins exceed 10% of all tools. The most common types of burins are on angle and on truncation. Carinated burins (Fig. 8, no. 33, 36) are not numerous. There are a few points on blades and a number of retouched flakes and blades, including one with “Aurignacian retouch” (Fig. 8, no. 38) (Hahn, 1977; Rogachev et al., 1982).

The bone and ivory tools include bone awls, points (Fig. 8, no. 35) and rods made on mammoth tusk fragments. Fragments of bone points decorated with parallel scratches were also found. Personal ornaments consist of perforated shells and fox teeth, as well as rods decorated with transversal parallel incisions.

No human remains have been found in association with the Kostienki 1, layer III, Aurignacian.

Discussion

The earliest EUP assemblages in Eastern Europe are from the Streletskaia industry at Kostenki 12, layer III, and the Spitsynskaya industry at Kostenki 17, layer II, dated to ca.36,000 BP (Fig. 9). On the other hand, the latest evidence of a Middle Paleolithic pres-
ence in the region is Buran-Kaya III, level B, dated to ca. 28 000 BP (Fig. 9). In a broad sense, the early Upper and late Middle Paleolithic industries coexisted in Eastern Europe from about 36 000 to about 28 000 BP. 

Sensu strictu, the early Upper Paleolithic and late Middle Paleolithic coexisted in Crimea from about 32 000 to about 28 000 BP. This radiocarbon chronology is confirmed by the stratigraphic positions of the Eastern Micoquian and Eastern Szeletian industries in the Buran-Kaya III sequence, as well as by the presence of Micoquian tools in the Aurignacian assemblages of Siuren I. So, this period of overlap in Eastern Europe lasts for about 8000 years. The end of this period was marked by appearance of the Gravettian in the Dniester and Don River valleys.

At the same time, there is no reliable evidence to suggest either generic links, or any other kind of interaction, between all of the archaeological groups mentioned in this paper. Thus, the Eastern European data demonstrate a parallel evolution of Late Middle and Early Upper Paleolithic industries during, at least, eight thousand years.

The appearance of the Aurignacian in Eastern Europe was relatively late, that is, after 30 000 BP, and postdates the first manifestation of true early Upper Paleolithic industries (Fig. 9). Thus, there is no sense in using an acculturation model for the interpretation of the Middle to Upper Paleolithic transition in Eastern Europe.

The available data suggest that Neandertals were responsible for the late Middle Paleolithic industries of Eastern Europe until 28 000 BP. The appearance of anatomically modern humans is dated to about 36 000-32 000 BP, although based only upon a single tooth. The first anatomically modern humans of Eastern Europe are not associated with the Aurignacian. They were the makers of specific Upper Paleolithic stone industries and worked bone assemblages, such as the Spitsynskaya and Gorodtsovskaya “cultures” (Fig. 9). At the same time, there are no reliable data to propose a core region for modern human dispersal into Eastern Europe.

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