Préhistoire Européenne, volumes 16 - 17 / 2000 - 2001, p. 111 à 132.

MIDDLE TO UPPER PALEOLITIC TRANSITION IN EASTERN EUROPE : TAXONOMICAL ISSUES

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Abstract

The debates on understanding of Middle to Upper Paleolithic transition in Eastern Europe are on the spot now. Nevertheless, not much attention is being paid to taxonomy as a key tool of data analysis. The proposed taxonomical approach challenges the ternary schema, which consists of such interrelated taxons as "technocomplex", "industry", and "type of industry". A wide sample of archaeological data has been analyzed in terms of various comparative strategies. The Middle to Upper Paleolithic transition in Eastern Europe has been understood as a nonlinear (multidimensional) process. Its archaeological interface points to the notion of two "lines of development" termed as transitional and early Upper Paleolithic industries, in which technological and typological variability has been documented.

The group of transition industries appears within two technocomplexes: the Epimicoquian and the Levallois-Mousterian of Tabun D tradition. The first comprises several industries with a distinctive combination of Micoquian and Upper Paleolithic traits and rooted the Middle Paleolithic Micoquian. The second is distinguished by a particular technology providing Levallois recurrent bipolar reduction and volumetric reduction within the same knapping context. The industries which belong to the technocomplex are geographically diverse: Kremenician (western Volhynia), Bohunician (Central Europe), Temnata cave, l. VI (Balkans), Levallois-Mousterian of Tabun D and Emiran (Near East). The consideration tentatively assumes that the bearers of this tradition, presumably anatomically modern humans, came to inhabit the part of Europe. Three technocomplexes have been described within the Early Upper Paleolithic line of development: the Aurignacian, the Archaic Gravettian, and the Epimicoquian. Each of them is represented by a number of industries which have been spread throughout the different territorial groups.

Indeed taxonomical studies hold great possibilities for arrangement and understanding of the Middle to Upper Paleolithic transition process. The perspectives implied by this kind of approach allow evaluation of common and particular features in techno-typological development as well as discussion of the conceptual meaning and social context of any sample under consideration. It also benefits the more objective multi-regional comparative research in which M/U Paleolithic transition scope is evidently needed. The long-standing debates of this matter indicate two major tendencies. First one argues that since the early occurrence of local distinctions in tool making, so-called individual or ethnic cultures, dependent on terminological preferences, do appear. The other one undertakes all possible natural factors and most importantly the raw materials procurement issues to define the stone assemblage variability.

Apparently the searching for an acceptable taxonomical model has not to be relied on its hypothetical social content. In other words, such social criteria as the same rooted origin, for example, is not to be placed in a definition but has to be subjected to consideration bearing on chronological, biological and any other available data.

There are many clams being made on the way to detailed taxonomical explanations (BORDES, SONNEVILLE-BORDES 1970, LIUBIN 1977, GLADILIN 1977, HENRY 1989, COHEN 1991, ANIKOVICH 1998). Some issues should be especially emphasized taking into account those models which are generic in character.

D.Henry coined the triple division taxonomy assigned to define hunter-gatherers social-economic development. The model consists of three hierarchical categories: phase, industry and assemblage and prompted to statistical analysis of lithic data (HENRY 1989: 79-89). As indicated in the study, assemblage is a highest taxon of the model."Industry" occupies the intermediate position, and facies/phase has the lowest cognitive notion.

As stated by other classification (COHEN 1991, 1997, 1999) :

Type of industry (lower level taxon) indicates peculiarities of different site assemblages which have been generated in the frame of the same industry. Basically its character relies on the economic function of the site (procurement site, residential site, hunting camp, etc.) as well as on variability in raw material procurement (quality, availability and so on).

Industry (middle level taxon) comprises assemblages of one or several sites. It is characterized by the same technology applied, as well as by the more or less constant tool-group composition. Depending on social features acquired and detected in archaeological data, the industry could be grasped as a techno-typological matrix of individual culture. In the meantime, some related industries may posit chronological stages of culture development as well. At a descriptive level, one may distinguish both homogenous and heterogeneous industries. The latter indicate technological or typological components of different technocomplexes which have been possibly acquired due to

either cultural contact or circumstances while the surface of the site was being alternately used by bearers of different traditions.

Technocomplex (high level taxon) is a multidimensional category in the nature which is generated from a complex and related interaction of environment, economy, and techno-logy (CLARK 1978). It combines groups of similar industries regardless of the matter of area which they came from. Technology is a major constitutive feature to the technocomplex. As stated by the data, industries of the same technocomplex could be of either common or separate (convergent) origin, as well as very geographically diverse.

The majority of taxonomic approaches appear with triple division models (Gladilin 1977, HENRY 1989, and COHEN 1991). Despite the chronological and explanatory disagreements, such a method of classification perceives a similar background for conclusion making. The same does not hold true in regard to the two-level taxonomy recently coined by M.Anikovich (1998, 1999). The model posits two hierarchically structured taxons, namely the archeological culture and the technocomplex. "Archaeological culture", as indicated in the model, exhibits the same origin and development, while the technocomplex stands for unlikely rooted and unrelated archeological cultures. It becomes apparent that the model above does not assume to define variability of the same cultural affiliation assemblages. These differences arise in terms of behavior pattern variability, and thus may not be accounted for by means of the model. Another appealing suggestion is that the taxonomic groups of the model have been onset distinguished taking for an interpretative (social) context.

Every category of the triple-model appears with a potential social meaning of explanation. However it is not a frozen but dynamic content which changes during Stone Age development. This method of structural analysis is equal to the task of both local distinctions and general social tendencies, understanding as it is certainly stated in archaeological data. So the hierarchical taxonomy is a considerable tool for arrangement and understanding of wide-scale lithic variability, and, at the same time, it is an objective point of archeological inquiries.

Special attention must be paid to the category "way of development" that does exist in Eastern European archaeology since the late 1960s (GRIGOR'EV 1970). By some accounts the "way of development" and the "technocomplex" are convertible terms (ANIKOVICH 1999). From another logical level, the term "way of development" ought to be used as a more objective counterpart of the term "epoch", certainly, in a term of Prehistory. Let us consider some instances to make the point concrete. Prehistoric Europe in some cases is characterized by a coexistence of Middle and Upper Paleolithic industries (VILLAVERDE *et al.* 1998, CHABAI *et al.* 1998, COHEN, STEPANCHUK 1999). The same holds true for chronological correlation of Middle Paleolithic and transitional industries. It is well known today that traditionally defined features to segregate Middle and Upper Paleolithic - the conceptual association of the first with Neanderthal and the second with *Homo sapiens* as well as the dividing blade and flake technologies - are not fully workable through Near East and Europe Paleolithic records. That most nearly means that such terms as "epoch" or "stage" which have been generated by a simple stage to stage evolutionary concept are insensate to the data and could be replaced, at least on a descriptive level, by the category "way of development" (Middle Paleolithic way of development, Upper Paleolithic way of development, transitional way of development).

The Middle to Upper Paleolithic transition in Eastern Europe is indicated by some distinctive features:
- Counting for age of earlier Streletzian sites at about 37-36 Kyr and latest transitional assemblages of Anosovsko-Telmanskaya culture at about 23-22 Kyr, the Middle to Upper Paleolithic transition occupied a wide chronological interval within the Inter-Pleniglacial.
- The latest Middle Paleolithic sites of the Crimea dated to Stillfried A and B do coexist with Krems-Dufour Aurignacian (OTTE *et al.* 1996, COHEN 1996, DEMIDENKO *et al.* 1998).
- Together with the Aurignacian, which is not uniform through Eastern Europe, the area under consideration indicates the Early Upper Paleolithic cultures of the non-Aurignacian affiliation that have been referred to the Post-Micoquian or Epimicoquian technocomplex (COHEN, STEPANCHUK 1999).
- The Eastern Europe data suggest the presence of some Middle to Upper Paleolithic transitional industries that unlikely rooted to the Middle Paleolithic scope (COHEN, STEPANCHUK 1999).
- Various techno-typological entities including those of local Middle Paleolithic affiliation and those of outside origin are suggestive of the transition in Eastern Europe (ANIKOVICH 1999, COHEN, STEPANCHUK 1999).
- The Early Gravettian industries of Eastern Europe are of relatively the same age, dated as late transitional industries and theoretically could be liable to acculturation process.

Chronostratigraphy and chronology

Despite the lack of Middle Paleolithic sites, the Kostenki area remains a key value to comparative chronology and stratigraphy study in regard to the Middle to Upper Paleolithic transition of Eastern Europe. Particular attention must be paid to such stratigraphic sequences as Kostenki 1, 14, and 17 *(fig. 1)*. It is quite reasonable to suppose that the chronostratigraphy is one of the most complicated and debatable problems in the Eastern Europe Paleolithic context (PRASLOV, ROGACHEV 1982, ANIKOVICH 1993, 1994, 1999, SYNITSIN *et al.* 1996, PRASLOV, SOULERJYTSKY 1997, and others). The basic evidence that allowed correlatation of stratigraphic sequences is the presence, in many Kostenki sites, of volcanic ash horizons barren archaeological remains as well as humic bed layers which either underlie (the lower humic thickness) or overlie (the upper humic thickness) the volcanic ashes (PRASLOV, ROGACHEV 1982,

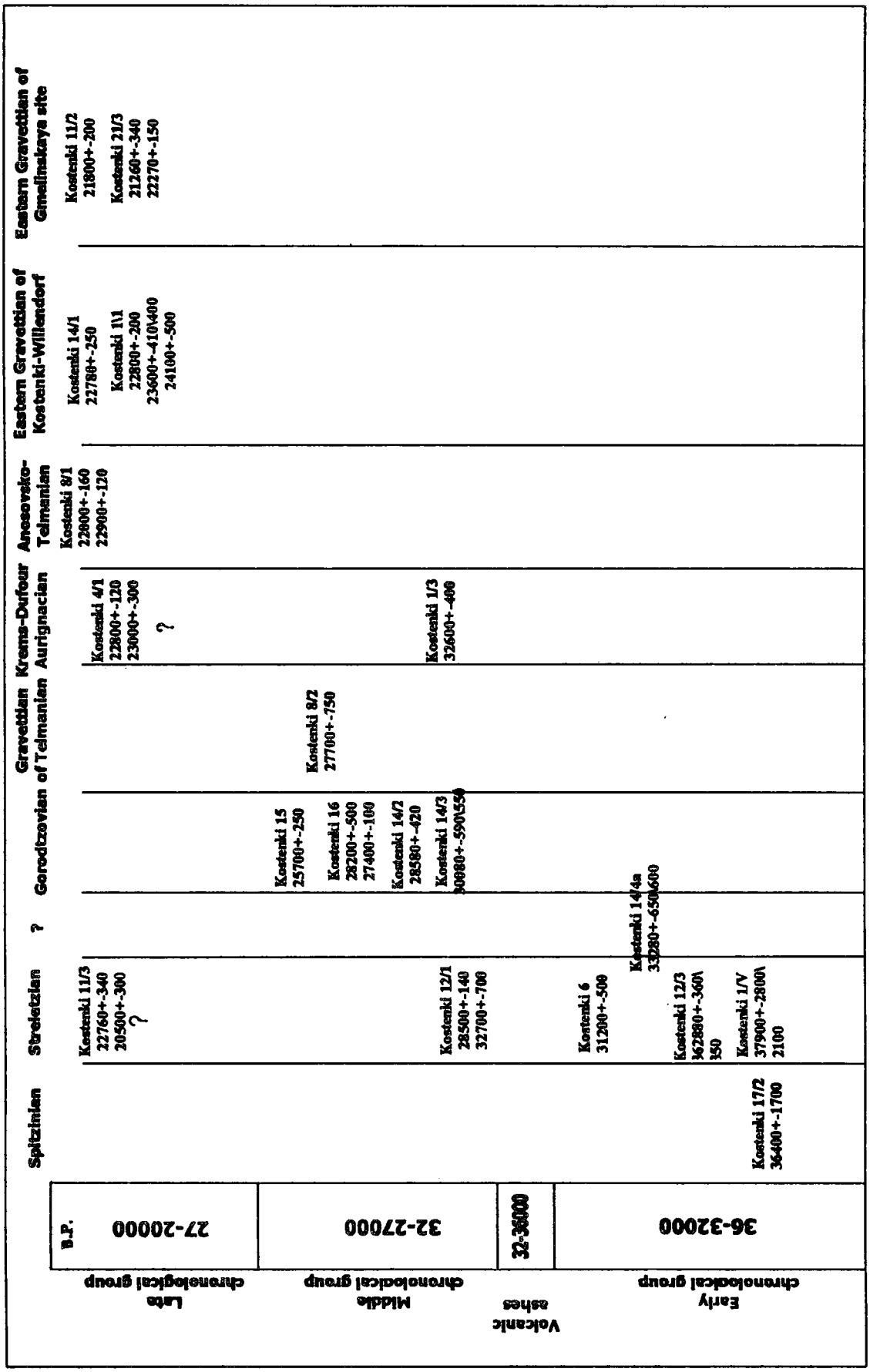

Figure 1 : Chronology of the Kostenkian group of sites
(based on Praslov, Rogachev 1982, Synitsin, Praslov 1997, Anikovich 1993, 1999).

SYNITSIN, PRASLOV 1997). In the meantime, recently conducted excavations brought new Aurignacian evidence that has been associated with volcanic ashes in the stratigraphic sequence of Kostenki 14 (A. Synitsin - personal communication).

This study observes the middle and lower chronological groups in Kostenki area, whereas both specifically concern the Middle to Upper Paleolithic transition. It is worthy to note some disparity between the presumed age of volcanic ash and chronological intervals of middle and upper groups as indicated by radiocarbon dates. The admissible estimate of volcanic ashes age in Kostenki is somewhere between 38 and 33 Kyr (LEFEVRE, GILOT 1994: 146) with the most credible value at about 35 Kyr and 38 Kyr (SYNITSIN, PRASLOV 1997: 28). Counting for absolute age of the ancient chronological group, the value at 33 Kyr seems to be more confident.

The issues of chronology for the ancient chronological group remain uncertain (ANIKOVICH 1993, SYNITSIN, PRASLOV 1997). By and large, the group includes such site as Kostenki 1/V, 6, 8/IV, 11/V, 12/II and III, 14/4 and IVa, 17/2 which are generally dated between 36 and 32 Kyr. Approximately half of the sites have been dated by radiocarbon. The oldest dates come from Kostenki 17/2 (36400±1700/1400, GrN12596), Kostenki 1/V (37900±2800/2100, GrA5245) and have been attributed to the Spitzinian and Streletzian respectively (*fig. 2*). The upper chronological limit is indicated by the date of 31200 ± 500 (GiN8572), that has been obtained for the Streletzian assemblage of Kostenki 6. The Streletzian assemblages of this site together with Kostenki 12/III as well as the Spitzinian of Kostenki 12/II are undoubtedly referred to the ancient chronological group, based on geological and absolute dating, while chronological position of Kostenki 1/V and Kostenki 14/4 is the matter of discussion (PRASLOV, SYNITSIN 1997). The currently available data are consistent in suggesting that Gorodtzovian is not represented to the evidence of ancient chronological horizon, whereas Kostenki 14/4 yielded two relatively young dates at about 28Kyr (OxA4116 and OxA4117) (SYNITSIN *et al.* 1996). Assemblage is characterized by a blade oriented industry without typical Gorodtzovian typological features. The fourth layer of the same site yielded three absolute dates in which the date 33280+-650/600 (GrN 22277) has been considered as the conventional one (DAMBLON *et al.* 1996). The industry is not yet well known (SYNITSIN 1996).

The ancient chronological group of the Kostenki area is suggestive of explicit lithic variability. The case deals with the Spitzinian industry (the Gravettian 0 after OTTE *et al.* 1996 or the Aurignacian-like technocomplex after ANIKOVICH 1999: 120) as well as the Streletzian industry with bifacial flaking and a blade industry of Kostenki 14/4 that is not yet determined. The available data is hardly ever to support a suggestion being made by L.Iakovleva that sites of the ancient chronological group of Kostenki 12/3 and Kostenki 14/4a have to be associated with the Gorodtzovian (IAKOVLEVA 1998: 125).

The middle chronological group is conventionally dated to the interval between 32 Kyr and 27 Kyr (SYNITSIN, PRASLOV 1997: 28). Despite the fact that the group is much better known, as indicated by many available dates (SYNITSIN *et al.* 1996, SYNITSIN 1996, DAMBLON *et al.* 1996, PRASLOV, SOULERZITSKI 1997, SYNITSIN, PRASLOV 1997) along with useful attempts to build up an internal periodization of the group (ANIKOVICH 1993), some key issues are not to the common point. First of all, the chronological position of some sites is the matter of debate. Dates such as those from Kostenki 1/3 form two clusters at about 25 Kyr and 32 Kyr. The selection of one or another relies upon how to date the Aurignacian appearance in Eastern Europe. By accepting the dates of 26-25 Kyr, one comes to the conclusion of an Aurignacian spread from west to east, considering the earlier age of the Aurignacian at Ripicheni-Izvor, Mitoc, and Siuren I (OTTE *et al.* 1996). At the same time, the dates of 32600±400 (GrN17117) and 32600±1100 (OxA7073) appear with more reliance upon stratigraphy and palynology data (SYNITSIN, PRASLOV 1997: 29). So the site of Kostenki 1/3 is probably an older manifestation of the Krems-Dufour Aurignacian in Eastern Europe.

By all accounts, the middle chronological group comprises such sites as Kostenki 1/3 (Krems-Dufour Aurignacian), Kostenki 8/2 and 3 (Gravettian of Telmanian), Kostenki 11/4 (?), 12/1, and 1a (Streletzian), Kostenki 14/2, 3, 15, 16, 17(?) (Gorodtzovian). Both Gravettian and Gorodtzovian industries occur at the Kostenki sequence for the very first time, while the Spitzinian is seem to vanish at that moment.

The ancient Gravettian of Kostenki 8/2 yielded three radiocarbon dates. The older one (27700±750, GrN 10509) comes from a charcoal sample and seems to be credible. The majority of dates gained from Gorodtzovian of Kostenki 12/1 (26300±300, GiN8574), Kostenki 14/2 (28200±700, Lu59b; 28380±220, GrN12598; 28580±420, OxA4115), Kostenki 14/3 (30080±590/550, GrN21802) and Kostenki 16 (27400±100, Le5270; 26800±600, GiN8083, 28200±500, GiN8031) and agree weel with one another. Likewise, the earlier date from Kostenki 14/3 acquired an additional correspondence.

There are six dates for the Streletzian of Kostenki 12/1a of the interval between 33 Kyr and 28 Kyr. Those pertaining to charcoal samples (28500±140, GrA5552; 32700±700, GrA7758) are more credible.

The late group chronology can be seen in the interval between 27 Kyr and 20 Kyr. The long list of sites is referred to the group (Kostenki 1/1, 2, 3, 4/1, 2, 5/1, 2, 7, 8/1, 9, 10, 11/1a, 1b, 2, 3, Kostenki 13, 14/1, 18, 19, 20, 21/1, 3, 5, Borshevo 1, 2). The data suggest that the earlier and later sub-groups must be taken into account (ANIKOVICH 1993, SYNITSIN, PRASLOV 1997, ANIKOVICH 1998). The late group shows coeval development of the Aurignacian, eastern Gravettian and bifacial flaking industries.

Not every point of the periodization has the same matter of reliability (ANIKOVICH 1998). For example, the interpretation of the Anosovsko-Telmanian industry (Kostenki 8/1 and 11/3) as being referred to Aurignacian-

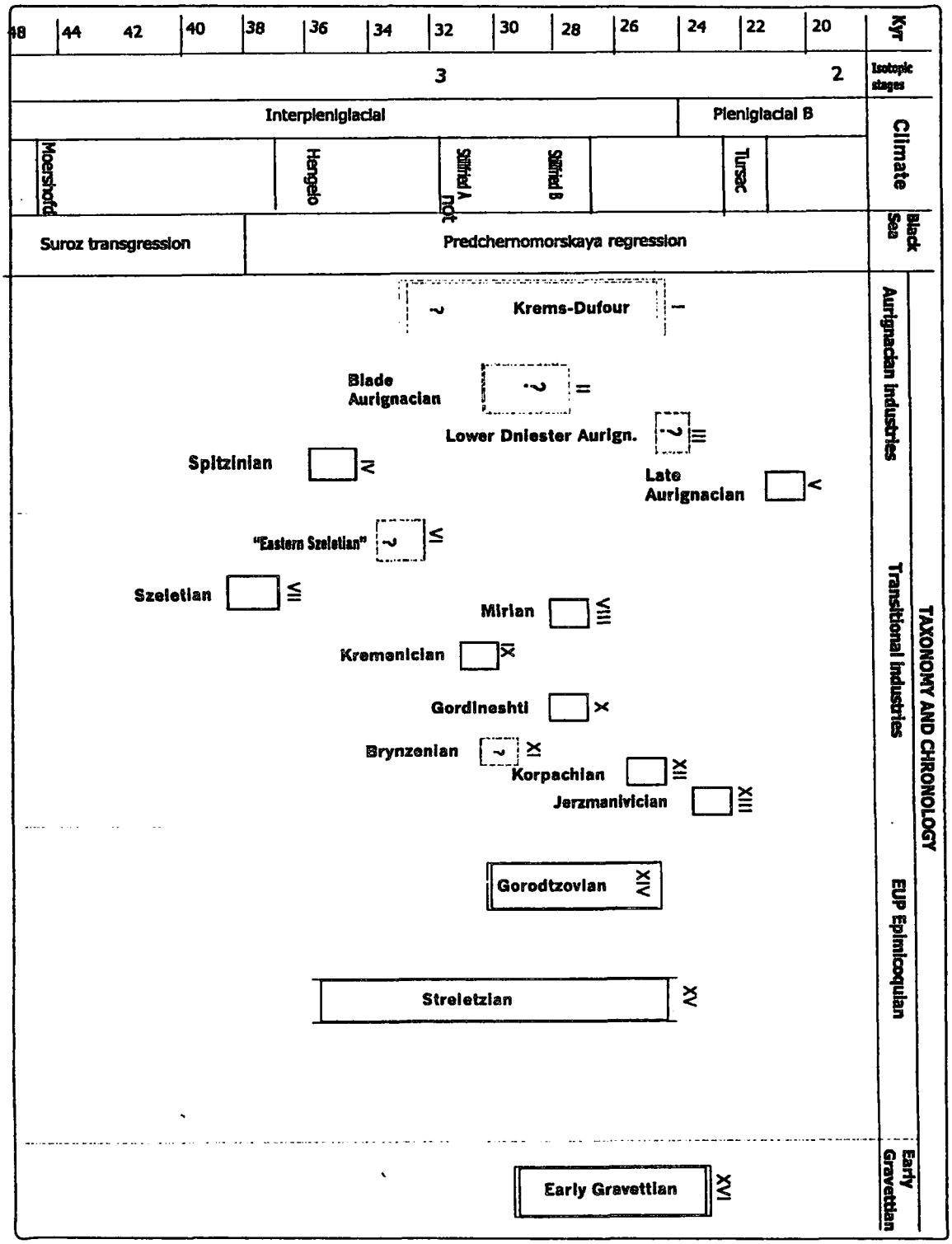

Figure 2 : Chronology of the Transitional and the Early Upper Paleolithic industries of Eastern Europe.
Legend : I. Mitok Malu Galben, Korpach Mis, Kostenki 1/3, Vorona III, Siuren I, Peremoga, Tinkova, Ivanichi, Chervonij Kamen ; II. Radomyshl, Zornov, Nenasitetz III ; III. Zelenij Hutor I and II, Climautsi I and II, Anetovka 13 ; IV. Kostenki 17/2 ; V. Sagaidak 1, Muralovka, Vorona III/1, Rashkov VII, Lubimovka ; VI. Buran-Kaya III/C ; VII. Korolevo II/2 ; VIII. Mira ; IX. Kulychivka ; X. Ripicheni Izvor 2a, 2b, Gordineshti, Trinka-Luka ; XI. Brynzeni, Ripicheni Izvor, Mitoc-Valea -Izvorolui ; XII. Korpach, Ripicheni Izvor 2b ;XIII. Telmanskaya l. 1 ; XIV. Kostenki 14/2, Kostenki 12/1, Kostenki 15, Kostenki 16, Kostenki 14/3 ; XV. Kostenki 12/3, Kostenki 1/5, Kostenki 12/1a, Kostenki 6, Sungir, Biriuchya Balka ; XVI. Molodovo V, l. 10-8, Telmanskaya, l. 2, Mira, l. II/2, Zornov, l. 2a.

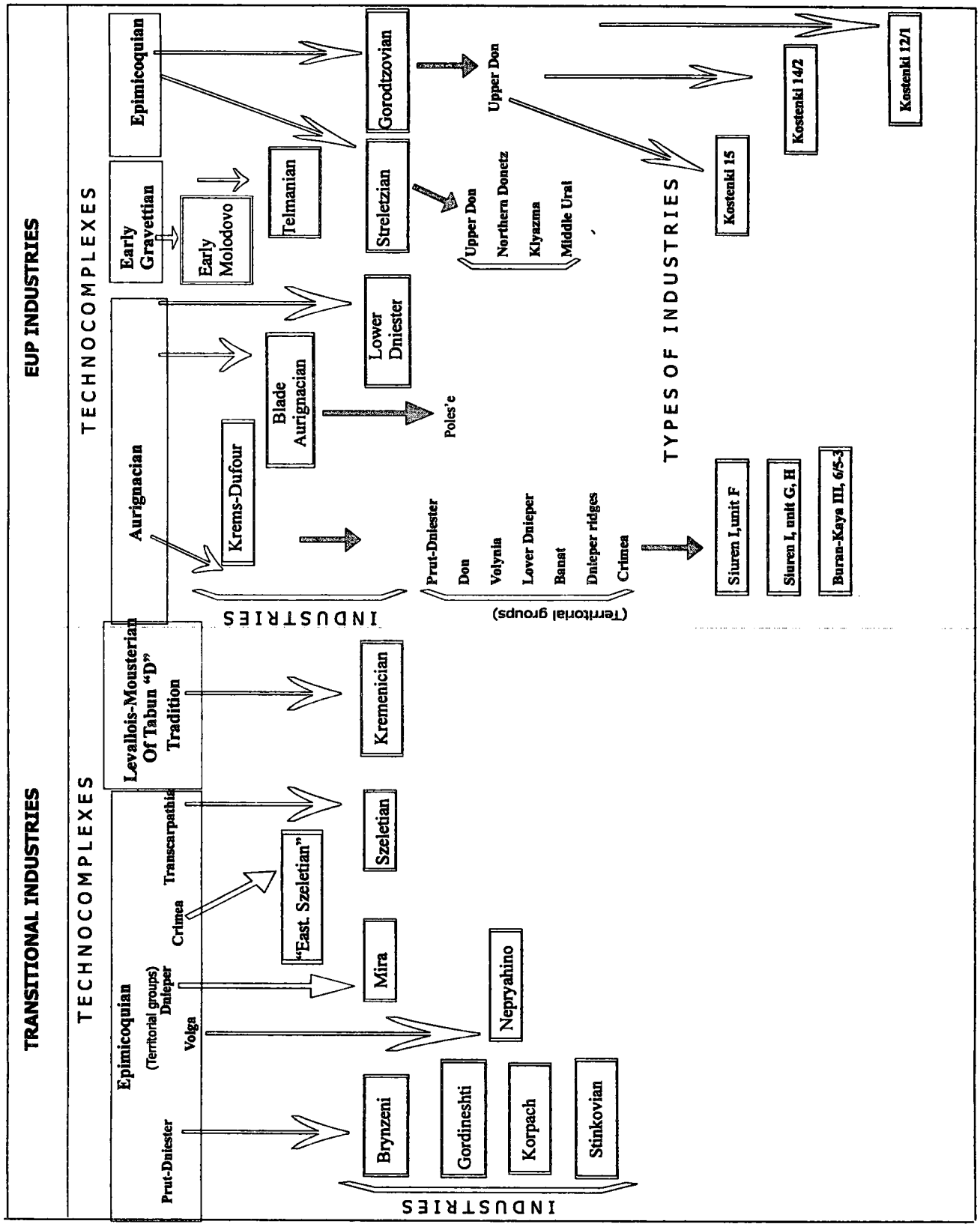

Figure 3 : Middle to Upper Paleolithic transition in Eastern Europe (taxonomy and territorial division).

Categories	Sites		
	Brynzeni	Gordineshti	Korpach
scrapers	4,2	1,9	6,9
points and Moust. Points	0,5	1,1	0,9
bifaces	1,8	3,7	3,9
backed knifes	5,66	0,7	1,7
endscrapers	3,7	13	8,2
burins	6,9	2,9	6,1
truncations	0,9	0,2	3
leaf point	1,5	0	0
scrapers	1,23	0,4	0
scaled pieces	0,29	0,4	0
backed bladelets	0,94	0	0
retouch. Bladelets	0	0,7	2,2
lunates	0	0	9,5
retouched blades	26,77	10,5	28,1
notched blades	3,77	2,8	0
points and Moust. Points	0	0	1,7
retouch. Flakes	9,65	39,2	14,3
notched flakes	9,86	8,1	10,1
retouch. Notches	0	8,6	0
denticulates	21,9	3,6	2,6
axes	0,4	0	0
beak tools	0	0,2	0
combined	0	0	2,6

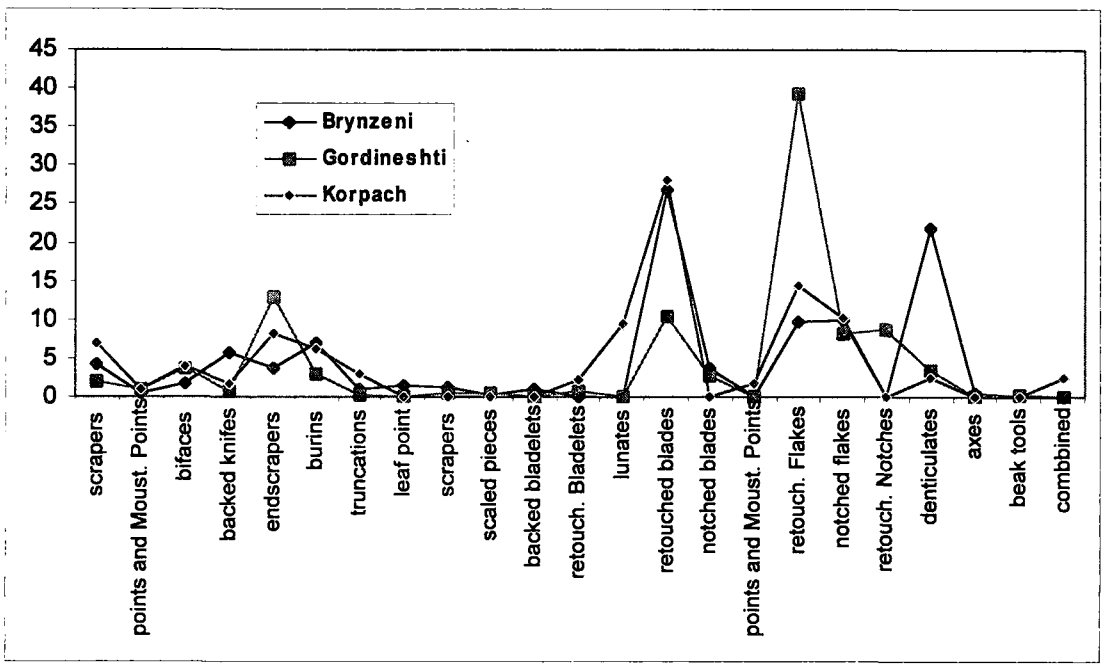

Figure 4 : Typological correlation of the Dniester-Prut transitional industries (plotted after Chirica et al. 1996).

like technocomplex as well as searching for its origin within Streletzian meets some objections. Despite the wide chronological break observed, Kostenki 8/1 has some features in common with the Jerzmanowician of Central Europe (PRASLOV, ROGACHEV 1982). Despite the very recent age of this industry (22000±160 GiN7998 and 22900±120 GiN7997) (PRASLOV, SOULERJYTSKI 1997), the Jerzmanowician affiliation remains credible. Additional explanations are certainly needed when one is exploring the presence of Streletzian points at Kostenki 11/3 as well as the appearance a bifacially worked leaf point in the Aurignacian of Kostenki 4/1. The chronological position of the former has been verified by dates (22800±120, GiN7995; 23000±300, GiN7994). The available data allow to consider the Aurignacian being at Kostenki area (if one does not refer to the Aurignacian as a whole body of industries with heavily retouched blades) since the time of the appearance of volcanic ashes (A. Synitsin) at the beginning of the middle chronological group and its recrudescence at the second half of the late chronological group. Both typological and genetic relations of these Aurignacian industries remain uncertain.

The late Kostenki group is characterized by the occurrence of eastern Gravettian with shouldered points in its two cultural manifestations, namely Willendorf-Kostenki (Kostenki 1/1, 13, 14/1) and Gmelinskaya cul-

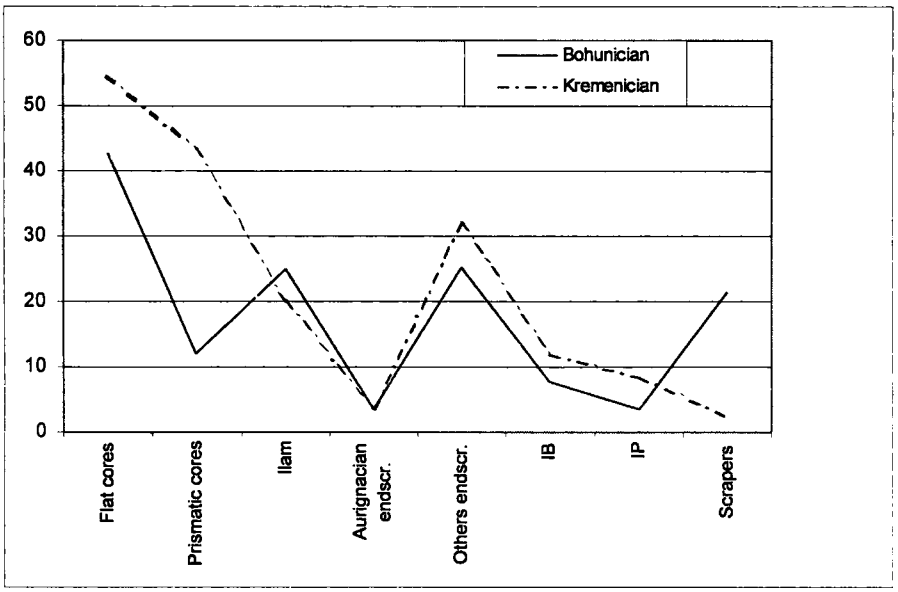

Figure 5 : Technological and typological correlation of Kremenician and Bohunician industries.

ture (Kostenki 11/2 and 21/3). The radiocarbon dates points to notion the chronological interval between 24 Kyr and 22 Kyr (SYNITSIN, PRASLOV 1997).

Summing up the data above *(fig. 1, 2)*, one concludes the classical cultural polyphony that each Kostenki chronological group observes. So Spitzinian appears through ancient chronological group evidence. The Upper Paleolithic industries of Micoquian tradition (Streletzian and Gorodtzovian) as well as early Gravettian of Telmanskaya, probably, are coeval with the evidence of middle chronological group, while upper chronological group is evident for eastern Gravettian with shouldered points. As observed in the data, most extended chronological sequence pertains to the Streletzian (BRADLEY *et al.* 1995).

The eastern Donbas represents another region where the Middle and Upper Paleolithic sites were recovered in the same stratigraphical sequences. The case includes the workshops of Biruchiya Balka at the Severskij Donetz valley (MATIUHIN 2000). Based on geology and palynology data, the Middle Paleolithic horizons are dated to early Würm, while the Upper Paleolithic layers were recovered under the Stillfried B buried soil, within the soil, and above the soil. Both Biruchiya Balka 2 and 1b are associated with Streletzian, while Biruchiya Balka 1a bears most resemblance to the Central European Szeletian (MATIUHIN 1999: 92-94).

The Middle Dniester group of sites (Molodovo V and Korman IV) contributed data to the question under consideration. The Molodovo V sequence combines the Middle Paleolithic layers (XI, XIIa, XII), so-called "transitional" layers (10a and 10b) and the early Upper Paleolithic occupations (X, IX) (IVANOVA, TZEITLIN 1987). The Middle Paleolithic layers were recovered within motley deposits, which is suggestive of environmental pattern in change. The latest Mousterian layer (XI) had been deposited at the interval between Brörup and Odderade (IVANOVA, TZEITLIN 1987: 112). The "transitional" assemblages are referred to the Hengelo buried soil as well as to the bottom of yellow loam that was concern a delluvium redeposition caused to rise of cold effect (IVANOVA, TZEITLIN 1987: 112). By all accounts, the so-called "transitional" layers are rather mistrusted, according to the data (ANIKOVICH 1992, BORZIYAK, KULAKOVSKAYA 1998). The bearing thickness are very eroded, damaged by solifluction and full of molehills that leave open the possibility of its not being *in situ* (COHEN, STEPANCHUK 1999). Both layers X and IX appear within Stillfried B soil and fully justified by radiocarbon dates (28100±100 LU15B and 29650±1320 LG15). The industry is based on prismatic non-Levallois knapping with few microliths (backed bladelets and needle-like point). Likewise, there are no typical Gravettian points. It is worth noting the presence of a few carinated endscrapers, burins (layer X), and bifacially worked tanged leaf point (layer IX) (CHERNYSH 1987). The Molodovo Early Upper Paleolithic is suggestive of an Early (Archaic) Gravettian affiliation together with such industries as Willendorf 5-8, Dolni Vestonice I, II, Pavlov I, II, Predmost, Telmanian, and Temnata X, IX. It is becoming clearer that the group above is not the same affiliation as that for Kostenki-Willendorf and its chronological position has been attributed to the Pavlovian phase of Gravettian (SVOBODA 1997). As becomes apparent, the early Gravettian is not uniform as to the technology and typology acquired, and the currently appropriate explanatory model is to search for an independent origin of each industry (ANIKOVICH 1998: 38). So the ancient Gravettian of Temnata has been considered in direct relations with the preceding Aurignacian in the same site sequence (TSONEV 1997). The Telmanian has been glanced over the Spitzinian (SYNITSIN 1997), while early Gravettian of Molodovo has been understood as either derivative of Szeletian transformation

(KOZLOWSKI 1986, GRIGOR'EVA, ANIKOVICH 1991) or of Bachokirian Aurignacian (BORZIYAK, KULAKOVSKAYA 1998). Such an interpretation of the Molodovo development agrees well with the evidence of Pavlovian origin that is rooted in Szeletian (VALOCH 1990, OTTE 1995). As a distinction from an idea of the Willendorfian-Kostenkian origin (SOFFER 1993), the Early Gravettian appearance stands for a rather polycentric model in which the group of different forerunners has been involved. Nevertheless the possible scripts of the Molodovo Upper Paleolithic origin have been constructed on a hypothetical level. The presence of Aurignacian components and lack of Gravettian points bear most resemblance to the Temnata sequence in the Balkans. The considered data raise the question of possible attribution of those Gravettian industries pertaining to the Pavlovian chronological horizon to a separate technocomplex - the Early (Archaic) Gravettian.

Another stratigraphical sequence includes Middle and Upper Paleolithic layers known at the Volynian site of Zhornov (PYASETSKI 1991, 1992). The lower layer (2) with Levallois-Mousterian industry is dated to 25000±400 (GiN4917). The overlying layer with Gravettian industry is dated to 28-27 Kyr, while the uppermost layer is suggestive of Aurignacian blade industry (COHEN, STEPANCHUK 1999).

The interesting sample of stratigraphic succession of transitional and Middle Paleolithic industries comes from the Crimean sequence of Buran-Kaya III site. The layer C industry with transitional features, so-called "Eastern Szeletian" (32350±700, OxA6672; 32200±1500, OxA6869; 36700±1500, OxA6673) was found under the Middle Paleolithic layer of Kiik-Kobian (28840±460, OxA6673; 32710±940, OxA4130) (CHABAI *et al.* 1998).

Using chronology and stratigraphy data, the Eastern European evidence has not always relied upon the classical sequence of Middle Paleolithic, Aurignacian, and Gravettian as observed in the Western European record. Thais was recently justified by the sequence of Mira at the Dnieper ridge area (STE-PANCHUK, COHEN 2001). Two culture bearing layers of the site were recovered within a buried soil of the Stillfried B interstadial and were conventionally dated by radiocarbon to 28-27 Kyr. The transitional industry (Mirian) appears in the upper layer, while the Gravettian assemblage is found in the lower layer.

There is no doubt that some of the Eastern European Upper Paleolithic industries are somehow rooted in the local Middle Paleolithic (ANIKOVICH 1992, 1999, COHEN, STEPANCHUK 1999). The controversial debates might be specifically concerned with the scope of transitional industries and its cognitive appearance in the data. We consider that it is fundamental to define the particular group of industries and the special character of distribution over the time and space (COHEN, STEPANCHUK 1999). Amplifying the thesis, it is reasonable to apply the proposed taxonomical model to consider the M/U Paleolithic transition. In the meantime, the proposed schema is weakly structured on the level of "type of industry" for some methodological obstacles. The difficulty is that the information that is supposed to distinguish assemblages at this level of analysis is not always available from archaeological resources, whether published or not.

Transitional industries

The Eastern Europe transitional industries form two groups which ought to be interpreted on the level of "technocomplex". The first is indicated by the presence of Micoquian features in technology and typology . The second is charactereristic of those industries which could be tentatively couched in terms of the Levallois-Mousterian of Tabun "D" tradition *(fig. 3)*.

The Epimicoquian technocomplex

The related distribution of sites indicates five territorial groups of the technocomplex, namely the Dniester-Prut, Dnieper ridges, Crimean, and Transcarpathian groups.

Dniester-Prut group

This group comprises such known sites as Brinzeny (CHIRICA *et al.* 1996, OTTE *et al.* 1996), Gordineshti (CHIRICA *et al.* 1996, Otte *et al.* 1996), Ripicheni-Izvor (l. 1a, 1b, 2a, 2b) (PAUNESCU 1993, BORZIJAK 1997), and Korpach (GRIGOR'EVA 1996, CHIRICA *et al.* 1996). The lower layer assemblage of the site of Brinzeny has been considered as the earlier Upper Paleolithic culture (Brinzenian) in the area, or in the strict sense of meaning, as a transitional culture from Middle to Upper Paleolithic (CHIRICA *et al.* 1996: 171). Another Prut culture has been also distinguished and subdivided into two chronological phases: the earlier (Gordineshti, Ripicheni-Izvor 1a, 2a, 1b, Trinka-Luka) and the late (Korpach, Ripicheni-Izvor 2b) (CHIRICA *et al.* 1996, Levitzkij, Borziyak 1999). Brinzeny lacks conventional dates, while age of earlier phase of Prut culture might be defined upon the absolute date of Ripicheni-Izvor 1b (28420±400, Bln809) and the late phase upon the date of Korpach (25220±300, GrN9758).

The transitional industries of this territorial group provide the similar make-up of the technological and typological features bearing on the same context appearance of Middle and Upper Paleolithic technologies. Besides, the tool kits represent typical bifaces, scrapers, Mousterian points together with endscrapers, burins, and retouched blades *(fig. 4)*. Brinzeny is distinguished by few portions of Levallois flaking and denticulated pieces. However the Levallois by-products are rather atypical (CHIRICA *et al.* 1996, Fig. 25) and unable to somehow interfere with interpretation. Cores of radial and prismatic preparation are more common than others. Scrapers appear in high variety and some of them have ventral thinning. There are typical leaf points. The Aurignacian component is limited to a few carinated and nosed endscrapers. Some high endscrapers are the products of either scraper or endscraper reduction. It is worth noting the presence of some backed bladelets. So to conclude, Brinzeny posits a combined Middle and Upper Paleolithic interface with distinct evidence of heterogeneity.

Gordineshti knapping technology is based on parallel and prismatic cores (CHIRICA *et al.* 1996). It should be noted that the view of Gordineshti technology as a manifestation of so-called late Levallois reduction (Levitzkij, Borziyak 1999) is not consistent with the data. The scrapers and Mousterian points rate is tailing away. However the ratio of bifacially worked pieces is twice as big than that in Brinzeny. There are typical leaf points including those with concave bases (CHIRICA *et al.* 1996, Fig. 4) that allowed some workers to consider Gordineshti in the Szeletian affiliation (ALLSWORTH-JONES 1990). Laterally retouched endscrapers are in overwhelming majority *(fig. 4)*. Typical Aurignacian endscrapers are in rare occurrence, while some high shaped tools are definitely an output of reduction technology. There are some marginally and alternatively retouched bladelets.

The Korpach industry bears most resemblance to Gordineshti, based on the very first occurrence of a number of segment-like microliths in Korpach (GRIGOR'EVA 1996). The Aurignacian typological component is missing, while bifacial tools ratio runs to 4% *(fig. 4)*.

The origin of the Prutian has been rooted in the eastern Micoquian (CHIRICA *et al.* 1996: 171). Probably the same holds true to Brinzenyan origin. This immediately raises the question of the role of the local Micoquian at Ripicheni Izvor in this process. By I. Borziyak's account, this suggestion might be possible. He also states that the late Micoquian of the Prut-Dniester area could be coeval with Gordineshti. However dated Micoquian assemblages of Ripicheni-Izvor (l. 3 and l. 4) can be seen in the interval of 46-45 Kyr and 44-43 Kyr (PAUNESCU 1993), while latest Micoquian layers (5 and 6) are not dated yet. From another point of view, Brinzeny and Gordineshti assemblages are rooted to industries of Stinka 1 and Pilipche XI (SYTNIK 1999: 190, 191). They are also rich in Micoquian features because of numerous bifacially worked leaf points together with scrapers. It is worth noting the rare high endscrapers worked on multi-edges debris and nodules. Unfortunately the Stinkovian is not conventionally dated yet. Therefore taking for possible resemblance with some others leaf point industries (Szeletian, Muselievo), Stinkovian ought to be some earlier than Prutian. As it was recently coined (Levitzkij, Borzijak 1999) the Prut culture evidence is in the form of a local Aurignacian variant with bifacial points. We are not to share this conclusion because of Gordineshti and others related assemblages are quite dissimilar to any Aurignacian industry when compared on the basis of technology and typology. Arguing for this notion is the fact that Prut industries specify combination regular blades and flakes endscrapers, bifacial flaking, and geometrical microliths with only few carinated endscrapers. One would expect that these high shaped endscrapers are the evidence of some Aurignacian influences. Data analysis allows to conclude that whole body of late industries with bifacial flaking of the Dniester-Prut area (Ripicheni-Izvor, Brynzeni, Mitok-Valya Izvorului, Gordineshti, Trinka-Luka, and Korpach) are quite similar one to another. They are undoubtedly non-Aurignacian affiliation. The differences between them are rather a matter of chronology. It is becoming obvious that the evidence is rooted in, not Levallois, but the Micoquian tradition, while a coexistence of Upper Paleolithic and Micoquian components has revealed an association with transitional industries.

Crimean group

As stated in the data, the Buran-Kaya III/C industry might be considered as a transitional one, since it combines late Crimean Mousterian and Upper Paleolithic Gorodtzovian features (MARKS 1998: 362). By an another account, this assemblage implies an appearance of the Kostenki Streletzian` and/or transitional Prut industries in the Crimea and thus has to be defined as "Eastern Szeletian" (CHABAI *et al.* 1998: 29-30, 38). As indicated in stratigraphy, layer C appears earlier than the Kiik-Kobian Middle Paleolithic level, and its absolute dates go with values of 36 Kyr and 32 Kyr (CHABAI *et al.* 1998, Tabl. 1).

Assemblage includes approximately 90% of chips gained from bifacial flaking. The core evidence is lacking. The tool kit comprises bifacially worked leaf points, knives, scrapers, scaled pieces and bifacially worked geometrical microliths (MARKS 1998: 359, 360). Endscrapers are made on primary flakes; however, implements reduced from other tools exist as well (MARKS 1998, Fig. 7g). Tools of Aurignacian typological association are missing. The assemblage attribution to the "Eastern Szeletian" as well as attempts to explain its origin in terms of migration of Streletzian bearers from the Don Area prompt some appealing suggestions. Besides, nothing but amazing sound is coming from a conclusion that earlier appearance of the Streletzian-like assemblage to the Middle Paleolithic one in Buran-Kaya sequence allows "to bury" the idea of possible genetic relations of the Crimean Mousterian and the Eastern Europe Szeletian-like industries (CHABAI *et al.* 1998: 38). It is certainly a truly emotional exclamation but not to the matter of facts.

The Szeletian is known on the Central European western frontier in Transcarpathian site of Korolevo 2/2 with conventional date of 38500±1000 (GiN2774) (ANIKOVICH 1992) and forms the Transcarpathian group of the Epimicoquian technocomplex.

Dnieper ridges group

This local group includes Mirian of site of Mira (up. L.) and, probably, surface collections of Uzvoz 1 and 2. Mira is located at 15 km southward from Zaporoz'e on the right Dnieper bank. Uzvoz sites are situated on left bank of the Dnieper near Vasilievka. The study of collections of the 2000 excavation of Mira is in progress, while Uzvoz 1 and 2 data is being edited (TUBOLTSEV, BUSEL 2001).

Assemblages contain indisputable evidence of the same context appearing the Middle and Upper Paleolithic technological and typological features. Most of Mira findings are small flakes and chips gained from tool retouching, maintenance and rejuvenation, including those of bifacial flaking. Typical cores are missing, apart-from some totally exhausted pieces. Bifacially worked

tools are Mousterian points and leaf points. The ventral thinning, facetting and scaling techniques are common to the data as well as wide practiced tools reduction and resharpening. Despite the same technological background, the assemblages of Uzvoz 1 and 2 posit some peculiar features that could be referred to its possible earlier age. So Uzvoz 1 appears with a majority of Mousterian points and scrapers, while endscrapers are in rare occurrence. It is worthy to note such specifically a emphasized type of scrapers as "Chokurcha triangle". Therefore the bifacially worked pieces are rare. All assemblages including Mirian hold no emphatic Aurignacian features. It is quite possible to suggest that Mira and Uzvoz represent different stages of the same tradition in the Dnieper ridges area. The Mirian appears to be similar to Prut culture data as well as to the Gorodtzovian industry of the Kostenki area. There are a number of features that relate the Mirian to the late Micoquian industries, especially those of the Crimean location. The detailed study and interpretation of these analogies is in progress.

Technocomplex Levallois-Mousterian of Tabun "D" tradition

For the Eastern European record, the features of this technocomplex figure in the Kremenician industry of Kulychivka (low. Layer) at western Volhynia *(fig. 3)*. Site is known as a result of long-standing excavations conducted by V.P. Savich (1975, 1975a, 1987). Our study is based on the sample from the 1979 excavations. The knapping technology combines two concepts of reduction: non-volumetric (flat) (67% and 42% of all cores) and volumetric (prismatic) (33% and 53.7% of all cores). The industry is explicitly oriented to large blades and Levallois point production. Flat core flaking surfaces were maintained in typical "Mousterian" manner by means of debordant removals, while prismatic cores were maintained in lateral crest technique. Kremenician data is suggestive of a variety of reduction models: centripetal, parallel, combined, and bipolar. Levallois recurrent bipolar reduction remains the more frequent occurrence. Levallois bipolar cores are 37% and 46% on average (taking for different portions of collection). Volumetric cores are characterized by typical perimeter flaking (sub-cylindrical, cylindrical, pyramid-like cores) and by part of perimeter flaking (frontal cores) in both unidirectional and bi-directional manners. It must be particularly stressed that Kremenician technology is not a mechanical mixture of conceptually different Levallois recurrent "Middle Paleolithic" and prismatic "Upper Paleolithic" technologies. Otherwise it sets up the very special technological interface with constitutional application of two reduction concepts. That is consistent to both primary and secondary reduction data - presence of facetting platform on prismatic cores, prevalence of sequential order of flaking on Levallois two-striking platforms cores, composition of volumetric and flat reductions applied to the same core, utilization of prismatic blades and Levallois removals for the same types of tool making.

Tools are rich, up to 3.4%. Blade tools (62%) are more common than flake ones (18%). Besides blade-flake tools (6.4%), core fragment tools (2%) and Levallois points (10% and 7%) are represented. The total amount of Levallois tools, including points and those on Levallois blades rises to 18%. Both worked bladelets and microbladelets are absent. The following techno-typological groups of tools must be taken into account: endscrapers (37% and 27%), retouched blades (19% and 29%), burins (15% and 9%), Levallois points (10% and 7%), and diverse (5% and 28%). Endscrapers are more common in the industry. Typical endscrapers are more common than other endscrapers (30%). They are basically produced on blades, among which primary blades are dominant. Based on working edge preparation, there are typical, flat, and high endscrapers. It is worth noting small samples of double, circular, sub-circular, carene, nosed, rabaux, and fan endscrapers. The tools of Aurignacian typological association (nosed, carene, fan, and rabaux) endscrapers amount to 5-6% of all endscrapers and 3.5% of all tools. Therefore, such characteristic features as high and/or lamellar retouch are indicated in other types of endscrapers as well.

Burin spall technique is characterized in Kulychivka by the presence of angle (41.5%), truncated (35.8%), dihedral (21%), carinated (3 pieces), and Baradostian (1 piece) burins. Some portions of collection include transversal burins as well. There are only a few scrapers, awls, atypical Mousterian points, and scaled pieces. Both bifacial and backed blade technologies traces are indisputably lacking through Kulychivka evidence.

The lower layer of Kulychivka underlies the buried soil of the Stillfried B interstadial with a date of 31 Kyr (BOGUTSKI, SAVICH, TATARINOV 1974, IVANOVA, RENGARTEN 1975, SAVICH 1987). The Kulychivka data prompts various matters of explanations. So, together with the Moravian Bohunician, it was considered as a new stage in Upper Paleolithic evolution of Levallois te-chnique - "bi-directional, pointed, bladed" stage (DEMIDENKO, USIK 1993: 241). It also was characterized as a final stage of Levallois technology (KOZLOWSKI 1986), or as a representative of Aurignacian-like technocomplex (ANIKOVICH 1994). Recently, detailed insight allows the Kremenician to to defined as a transitional Middle to Upper Paleolithic industry (COHEN, STEPANCHUK 1999: 311, GENESTE *et al.* 1999: 154). As can be seen from available data, the known Aurignacian industries are not indicative to whether Levallois or special Levallois and prismatic combination technologies. That is becoming appeal to the point of somehow Aurignacian affiliation of the industry. From the matter of typological perspectives, the Kremenician is rather a heterogeneous industry. Its basic non-Aurignacian component bears most resemblance to such industries as the Bohunician, Temnata l. VI, and the Emiran. The Aurignacian component appearance could be subjected to various interpretations in which acculturation is the most appropriate explanatory model yet available to us.

Now there is no doubt that the western Volynian Kremenician bears most resemblance to the Central European Bohunician (DEMIDENKO, USIK 1993,

KOZLOWSKI 1996, SVOBODA *et al.* 1996, COHEN, STEPANCHUK 1999, GENESTE *et al.* 1999). Therefore the detailed comparison has not been made. Proceeding to the matter, we are referred to technological and typological issues of Bohunician industry (SVOBODA, SKRDLA 1995, SVOBODA *et al.* 1996). The comparative data is plotted on the graph (*fig.* 5). Both industries indicate the same kind of technology which is in the same context of prismatic and Levallois recurrent reductions. The Bohunician differs from Kulychivka by an increase in the flat core index. In addition, Bohunician assemblages include many centripetant Mousterian cores, while Kulychivka provides only few such specimens. The average values of blades is almost the same (20-25%). It is worthy to note an even more explicit stand of heterogeneity than that traced through Bohunician data. Along with "Aurignacian" tools, there are bifacially worked leaf points, probably caused by contacts with Szeletian bearers (OLIVA 1984). The appearance in some Moravian Szeletian assemblages of Levallois reduction technology stands for the mutual character of these contacts (VALOCH 2000). As stated above, the Kremenician lacks bifaces. Both industries include the same ratio of Aurignacian endscrapers (3.5%), while the Kremenician shows higher burin and point indices. Unfortunately, the so-called ILty may not be cited due to its lack through publications. The point index, that includes Levallois points as well, ranges between 2% and 5% in the Bohunician, while the average Levallois point ratio is up to 8.5% in Kulychivka. The scrapers, being in rare occurrence in Kremenician, is rich (up to 21.6%) in the Bohunician. Thus, to conclude, both industries indicate a high resemblance as to the technology and typology used. Differences between them are probably caused by different natural and cultural environments in which both subsisted. The data above justify a parting of Kremenician and Bohunician on the level of "industry" and the same affiliation on the level of "technocomplex".

The Bohunician sites appear in Slovakia and Moravia in the chronological interval between 43 Kyr and 36 Kyr as (SVOBODA *et al.* 1996). Thus its latest manifestations are about five or six thousand radiocarbon years early that those of Kremenician. Recently the Bohunician was recovered at Nizniy Hrabovetz locality in the eastern Slovakia. The raw material study indicates the wide area of procurement which spread out upper Silecia and southern Poland up to Dniester and Carpathian basins (KAMINSKA *et al.* 2000: 71). The data suggest that Bohunician traces in the eastern Slovakia is evident to connect its Moravia-Silecia centers with western Volynia (KAMINSKA *et al.* 2000: 80). It seems possible to conclude that Kremenician appearance could be seen as the result of a migration or gene flow which has been generated by the Central European Bohunician.

The Bohunician origin is rooted to the Balkans as evidenced in the Bulgarian cave Temnata, l. 4 (sector TD-II) (GINTER *et al.* 1996, KOZLOWSKI 1996, 1998). From the point of view of stratigraphy, this transitional industry precedes the Bachokirian Aurignacian that is conventionally dated to 39100±1800 (OxA5169) and 38300±1800 (OxA5172) with no genetic links observed (GINTER *et al.* 1996). The lithic reduction is characterized by a traditional combination of Levallois recurrent and volumetric (i.e. prismatic) models. The tool kit is distinguished by numerous scrapers and rare Levallois points. Blade tools are more common than flake tools. Regular endscrapers appear in high frequency. There difficulties in chronological definition of the Temnata industry; it is roughly placed between 50 Kyr and 45 Kyr. The typological data allow to assume that the Bohunician postdates Temnata, since it has a higher scrapers index and lacks Aurignacian features.

Scholars believe that the Temnata transitional industry originated from the Balkan Levallois-Mousterian with leaf points of Muselievo-Samiulitza type and was even partly coeval with its latest manifestations (GINTER *et al.* 1996, KOZLOWSKI 1996). Therefore these industries differ in numerous significant ways, and Temnata industry provides no evidence of bifacial flaking. We are not to tell that the above conclusion is wrong, but are telling that there is no indisputable evidence to support this view.

In the search for analogies to the Bohunician, some workers refer to the Near East transitional industry or Emiran (VALOCH 1990, 2000, MARKS 1993, SVOBODA 1993, SVOBODA *et al.* 1996, Kuhn *et al.* 1999). K. Valoch considered these industries as identical, while A. Marks found that there were "striking" similarities. Viewed from absolute chronology, the Emiran occurred in the interval between 47 Kyr and 34 Kyr. The Emiran is undoubtedly a non-Aurignacian industry, which generated the Upper Paleolithic of the Ahmarian tradition (MARKS 1993). As stated for Kebara cave excavations, the earlier Ahmarian appeared at about 42 Kyr and had replaced by Levantine Aurignacian at about 36 Kyr that is not rooted in the Near East evidence (BAR-YOSEF, BELFER-COHEN 1996). The lower layers of Negevian Boker Tachtit do characterize the Emiran technology as a pattern of combination of Levallois recurrent reductions in its unidirectional and bi-directional versions. The upper layer shows vanishing of Levallois technology (MARKS 1983). The Emiran typology is indicative by a high scrapers index which proliferates from bottom to the top (26% and 10% respectively). The general assemblages composition posits typical Upper Paleolithic make-up (MARKS, FERRING 1998). So Middle to Upper Paleolithic transition at the Near East comes into focus earlier than elsewhere (BAR-YOSEF *et al.* 1996). It did not rely upon biological changes since it is possibly attributed to anatomically modern humans (BAR-YOSEF 1999) and does not concern the Aurignacian.

So the considered industries (the Near Easter Emiran, the Balkan Temnata l. IV, the Central European Bohunician, and west Volhynia Kremenician) bear strong resemblances as indicated by techno-typological comparisons and should be attributed to the same technocomplex. The data analysis indicates that basic features of the above industries can be observed in Tabun D like assemblages of the Levantine Mousterian. The modern view concerning the Levantine Mousterian observes the different traditions

in that group as well as possible genetic relations of the transitional industry of Emiran with evidence of that from Tabun D tradition (MARKS, MONIGAL 1995, MEIGNEN 1998). The industries of Tabun D association combine Levallois and non-Levallois reduction in convergent and bipolar versions with minimal preparation of striking platforms. Both blades and Levallois points are common. The crested blade preparation is suggestive of volumetric technology. The Upper Paleolithic tools (retouched blades, burins, endscrapers, and backed knives) are typical together with frequent scrapers. Levallois points are distinguished as being of elongated proportion (GARROD, BATE 1937: 115, BAR-YOSEF 1996).The long-standing sequence of Tabun D tradition is rather doted to the evidence. As observed in the Tabun cave chronology, the oldest assemblages are dated between 270,000 and 170,000 years (MERCIER *et al.* 1995). The sequence seems to be continued in the Rosh Ein Mor site, dated to about 85,000 years (TL chronology) and at Boker Tachtit, dated to 47-45 Kyr (MARKS, MONIGAL 1995). It seems fundamental to tentatively specify the above group as the technocomplex of Levallois-Mousterian of Tabun D tradition. It is characterized by the composition of Levallois recurrent and prismatic reduction. The oldest and early transitional industries have high scraper indices, while late transitional industries are indicative of heterogeneity.

We suggest in a very preliminary matter that the first appearance of the Near East Levallois-Mousterian of Tabun D tradition in Europe occurrs during the Eemian interstadial. Its potential manifestation might be exemplified by the assemblage of the site of Yezupil l. III at the Dniester's Podolia (north-west Ukraine). This stratified site has been studied and published by O.Sytnik (2000: 252-274). The lower layer (III) was found within a buried soil that is geologically dated to the Eemian interstadial. The overall assemblage composition includes cores (3.7%), tools (15.6%), and Levallois blades and flakes (7.9%). The majority of tools have been made on Levallois removals and prismatic blades. Both cores and debitage products analyses indicate the presence of Levallois recurrent reduction in its uni-polar and bipolar versions together with prismatic and discoid reductions. Unfortunately, the published data does not allow definition of a quantitative correlation between these models. Tool-groups provide a number of classes, namely Mousterian points (6.3%), Levallois points (17.4%), scrapers (7.9%), and knives (46.4%). Upper Paleolithic tools are also represented. As stated by the author of the excavations, the Yezupil l. III assemblage can be compared to a wide range of correspondences including those of Molodovo V and I, Seclin like industries of France and Belgium, and Levantine Mousterian (Sytnik 2000: 259). As is well known, the non-Levallois industries of Seclin are explicitly blade oriented and, therefore, have no all those features found in Yezupil technology in common. The similarities to Levantine Mousterian are rather limited of Tabun D tradition which is solely responsible for the Middle Paleolithic technological composition of Levallois recurrent and prismatic reduction.

Early Upper Paleolithic industries

The Eastern Europe data have been entirely placed within two groups, namely Aurignacian and non-Aurignacian industries. The first group of industries appears within two technocomplexes: the Early Gravettian and Epimicoquian. Proceeding with geographic data, several territorial groups must be taken into account.

Aurignacian technocomplex

The dating of the Eastern European Aurignacian is the subject of debate. It has recently been argued that earlier Aurignacian industries occurred first in the deeply stratified site of Mitoc Malu Galben between 33 Kyr and 30 Kyr, an argument suggesting an eastward direction of Aurignacian spread (OTTE *et al.* 1996, COHEN, STEPANCHUK 1999). It is based upon the preference of a cluster of dates at 26-25 Kyr rather another cluster at 33-32 Kyr from Kostenki 1/3. However some workers fairly argued the earlier dates are more convenient (SYNITSIN, PRASLOV 1997). The indirect confirmation arises from the recent discovery of Aurignacian evidence at volcanic ashes horizon of Kostenki 14 sequence (A.Synitsin - personal communication). Other related issues come from rethinking Spitzinian taxonomy that has been grasped with Aurignacian-like technocomplex (ANIKOVICH 1999). As is well known, the Spitzinian chronology is based upon both stratigraphy and absolute date of 36400 +1700-1400 (GrN 12596). Thus the available data remain possibility to compare the Central European and the early Kostenkian Aurignacian, bearing that the former is most likely not of Krems-Dufour tradition.

The Crimean group

The Aurignacian industry of the Krems-Dufour tradition is known in stratigraphical sequence at Siuren 1 (BONCH-OSMOLOWSKI 1934). Two stages of Siuren 1 Aurignacian were identified on the basis of prior excavation data (COHEN 1996). New excavations brought valuable information with regard to a more precise chronostratigraphical division including radiocarbon dates (OTTE *et al.* 1996, DEMIDENKO *et al.* 1998, CHABAI *et al.* 1998). The Aurignacian industry of Siuren 1 is divided into two sub-types (DEMIDENKO *et al.* 1998). Thus, it was confirmed that the industry underwent some changes over time. Other Aurignacian assemblages are known from the evidence of Buran-Kaya III (l. 6/5, 6/4, 6/3) (YANEVICH 1999). The author of excavations arguably considers these assemblages as being attributed to a particular Aurignacian industry which should be distinguished from that in Siuren 1. Likewise the Buran-Kaya III assemblages seems to bear the most resemblance to the Transcaucasus Aurignacian of Taro-Klde, Svanta-Savane, and Dzudzuana (YANEVICH 1999: 135). Blade and bladelet tools appear at Buran-Kaya III in less frequency than at Siuren 1. However it doesn't give us any cue concerning cultural specifics of Buran-Kaya

Aurignacian, since this kind of variability fits well with that observed in the Krems-Dufour Aurignacian. The evidence under discussion includes carinated endscrapers, Dufour bladelets and Krems points that are typical of Krems-Dufour cultural context. Most of the Transcaucasus sites considered by A.A. Yanevich as similar to Buran-Kaya III data either have stratigraphic problems (KOZLOWSKI 1970, 1972) or have been referred to the same Krems-Dufour Aurignacian (COHEN, STEPANCHUK 1999). Thus it is argued that differences in Buran-Kaya III (l. 6/5-3) assemblages should be specified at the level of "type of industry", that does not concern the cultural way of reasoning.

Recently updated stratigraphy of Siuren 1 appears with three units : lower unit (H) (first observed during the 1994-1996 excavations), unit (G) (that is provided by G.A.Bonch-Osmolowski lower layer data), and unit (F) (that was the same as middle layer of prior excavations). Some assemblages of units (H) and (G) have indicated the same affiliation of early sub-type of the Siuren industry, while assemblages of horizon (F) represent a late sub-type (Demidenko *et al.* 1998). Both chronological stages are conventionally dated to Stillfried B as it is indicated in absolute chronology (l. Ga - 28450±600, OxA5154; l. Fb2 - 29950±700, OxA5155 [Pettitt 1998]).

The techno-typological analysis of each stratigraphical horizon has been published in detail (Demidenko *et al.* 1998). The early industry is generally characterized by Krems points, high index of Dufour bladelets, bifacially and uni-facially worked Middle Paleolithic tools, frequent bladelets, and prevalence of straight bladelets over twisted ones. The late assemblage has no evidence of Krems point and Mousterian tools.

Studies of collections of the Crimean Aurignacian to date have indicated that they are mostly similar one to another. This most nearly means that culture does not contribute in any way to the problem in the definition of differences in assemblage composition. Thus to conclude, the Crimean Krems-Dufour Aurignacian includes three type of industries: Siuren 1 (unit F), Siuren 1 (units G and H), and Buran-Kaya III (l. 6/5-3).

Don group

The group is characterized by the industry of Kostenki 1/3 (ROGACHEV 1957, PRASLOV, ROGACHEV 1982: 64). Knapping technology is evidently blade oriented. The core majority is secondary used pieces designated to microblade removals. Endscrapers are more common than burins. The high core-shaped endscrapers including those of carinated type are most frequent. Scaled pieces are mass-products. The retouched bladelets (non-geometric microliths) including those of alternate retouch are most typical to the body of industry.

The Krems-Dufour Aurignacian is geographically diverse throughout the Eastern European record. Along with the group described above, other territorial groups must be taken into account: the Volynian group (Ivanichi, Chenvoni Kamen), the Dnieper ridges area (Vorona III), and the Lower Dnieper group (Peremoga) (COHEN, STEPANCHUK 1999). In addition, the south-eastern region provides the Banat (Tinkova) (CHIRICA *et al.* 1996) and Prut-Dniester groups. Therefore they do not form wide concentrations of archaeological sites and cannot not reveal evidence of local origin.

Prut-Dniester group

The Krems-Dufour Aurignacian of this area is represented by the site of Mitoc Malu Galben (l. 12a, 12b, 11 bottom, and 10b) (CHIRICA 1995, CHIRICA *et al.* 1996) and Korpach-Mis (GRIGOR'EVA 1996, CHIRICA *et al.* 1996). The Aurignacian layers of Mitoc are dated to the interval between 33 Kyr and 30 Kyr, while Korpach Mis is geologically suggestive of the Stillfried B interstadial. So it is possible to explain the Korpach Mis origin as due to movement of the Mitoc population (CHIRICA *et al.* 1996: 170). The Korpach Mis is blade-flake oriented, based on core and blank descriptions. There are classical core-shaped carinated endscrapers, carinated burins as well as polyhedral and dihedral burins. It is worth noting the presence of leaf bifacial points and lack of Dufour bladelets. The appearance of bifacial flaking possibly stands for evidence of contacts between local Krems-Dufour Aurignacian and Epimicoquian.

The majority of the Eastern European Aurignacian falls within the Stillfried B interstadial and refers to a late phase of Aurignacian if one follows the issues of Aurignacian periodization (see: DJINJIAN *et al.* 1999). From the Eastern Europe evidence, the Krems-Dufour Aurignacian people subsisted in different landscape and hunted a variety of mammal species (reindeer, mammoth, saiga). In some cases the hunting was explicitly specialized to procurement of one or two species. Despite this, assemblages do not vary much in composition and differ form one another by components that might be borrowed from the specific "neighborhood" of each case. It can be thus inferred that the Aurignacian of Krems-Dufour tradition of Eastern Europe is not a same kind adaptation system but a rather stable cultural tradition.

Blade Aurignacian

As noted above, the Aurignacian technocomplex in Eastern Europe includes several industries. One of them groups the sites of Radomyshl and Zornov and appears under the conditional name of "blade Aurignacian" (COHEN, STEPANCHUK 1999). The chronological position of the industry remains unclear. Therefore the date of 28100±500 (GiN4143) from the underlying Gravettian layer at Zornov (PYASETSKIY 1991) suggests a younger age of this industry. Assemblages are explicitly oriented to big blade production, similar to those of the early Dniester Gravettian. There are many heavily retouched blades, endscrapers, scrapers and laterally retouched blade endscrapers. Neither carinated endscrapers nor carinated burins are characteristic of this case. However fan-like endscrapers are quite typical. Judging from the publications, the Levallois technique is absent (SHOVKOPLYAS 1964, PYASETSKIY 1991). At present, there is no data to fill in details for the develop-

ment of the Eastern Europe blade Aurignacian. As a preliminary hypothesis, this industry might be derived from the Bachokirian Aurignacian (COHEN, STEPANCHUK 1999).

Late or developed Aurignacian

This kind of industry occurred on such sites as Sagaidak 1 and Muralovka. Taking into account that sites are far from each other, two territorial groups must be defined, namely the north-west Black Sea coast (Sagaidak 1) and the lower Don area (Muralovka). The industry lacks gravettes and micrograveltes. Both Dufour bladelets and chip points appear in high frequency. The chronological position has been defined on the basis of radiocarbon dates: Sagaidak 1 (21240±200, Le2424; 20300±200, Le16026), Muralovka (18780±200, Le1438; 19630±200, Le1601) (SVEZINTSEV 1993). However, based on palynological data, E.A.Spiridonova considers the Muralovka dates as too young and places the industry in the Tursac interstadial in the interim of 23 Kyr and 21 Kyr (SPIRIDONOVA 1991). The comparative study assumed that both sites are about the same age and its appearance is suggestive of a specific chronological horizon of the northern Black Sea coast Upper Paleolithic (COHEN 1999). It is worth noting that late Aurignacian industries come into focus of the European and Near East evidence at about the same time and in some cases they did not directly succeed the preceding Aurignacian.

In the data of the Black Sea coast area, there is another particular Aurignacian industry that bears most techno-typological resemblance to the Moravian Aurignacian of Vedrovice II and Kuparovice 1 (COHEN, STEPANCHUK 1999).

Early Upper Paleolithic industries of the Epimicoquian technocomplex

As implied by the model, the Early Upper Paleolithic of Eastern Europe is especially interesting for the evidence of non-Aurignacian industries. This group includes two technocomplexes: "the Early or archaic Gravettian" with most explicit manifestations in the Molodovian and Telmanian and "the Epimicoquian" of the Gorodtzovian and Streletzian.

The Streletzian sites are geographically diverse through the Eastern Europe. They were found in the upper Don area (Kostenki) (PRASLOV, ROGACHEV 1992), the eastern Donbas (Biruchiya balka) (MATIUHIN 1999, 2000), the north-east of Russian Plain (Sungir) (BADER 1978), and the middle Ural (PAVLOV 1992). We believe that Streletzian sites are not known westward of the Dnieper basin. Not one of the above regions, except for the Seversky Donetz area, provides indications of athe preceding Middle Paleolithic. The problem of geographic variability within the Streletzian has been first stated by A.E.Matiuhin who pointed out the local variant in the eastern Donbas area (2000). Both periodization and chronology of the Streletzian have been developed by M.V.Anikovich (PRASLOV, ROGACHEV 1982, ANIKOVICH 1992, 1993, BRADLEY *et al.* 1995). Chronological and geographical data coupled together raise the question of correlation between different Streletzian territorial groups. Chronostratigraphic and radiocarbon issues place the earlier Streletzian within the ancient chronological group of the Kostenki area (Kostenki 1/5, Kostenki 6, Kostenki 12/3) with the earlier date of 36280±360/350 (GrA 5551) (SYNOTSIN, PRASLOV 1997). In the Kostenki data, the Streletzian persists at the beginning of the middle chronological group as well (Kostenki 12/1a). The same age is hypothesized for the first Streletzian in the Seversky Donetz area (MATIUHIN 2000: 43). The terminal stage is dated to 25-24 Kyr in Sungir (BRADLEY *et al.* 1995). Thus the Seversky Donetz group is evident to the whole Streletzian sequence except for an early stage, while relevant Kostenki sites appear within early and middle groups. Streletzian development biases gradual replacement of flake by blade reduction as well as increase in Upper Paleolithic types and decrease in the use of bifacial flaking. It should be especially emphasized that Middle Paleolithic tools exist through the entire extent of this industry, while tools of Aurignacian typological association occur at the late stages (BRADLEY *et al.* 1995). Unlike the transitional industries of the same technocomplex, the Streletzian provides two basic groups of bifacially worked points, namely leaf and triangular (i.e. Streletzian) points. It seems to be the case that triangle points displace leaf points throughout the Streletzian duration. The general assemblage composition is different in the Streletzian (PRASLOV, ROGACHEV 1982: 65, 139, MATIUHIN 1999), while the ratio of bifaces, scrapers, and endscrapers is always considerable.

The Gorodtzovian industry bears resemblance to Streletzian and especially in the domain of characteristic tools, such as endscrapers, burins, and scaled pieces. Therefore, formal indices indicate developed blade and Aurignacian-like components in the Gorodtzovian as well as less bifacial flaking and lack of triangle and, it appears, leaf points. The Mousterian group of tools is distinguished by typical flake implements, such as scrapers and limaces. Scaling and thinning techniques are very characteristic of this industry. Most people agree that the Middle Paleolithic typological component made either on quartzite or flint is not a case of admixture, but an inseparable part of the Gorodtzovian interface (SYNITSIN 2000: 303).

The most reliable Gorodtzovian dates are between 29 Kyr and 26 Kyr and fit with the Kostenki middle chronological group (SYNITSIN, PRASLOV 1997, SYNITSIN *et al.* 1996, PRASLOV, SOULERJYTSKY 1997, DAMBLON *et al.* 1996). All related assemblages appear with an explicit variability due to raw material used and typoiogy observed. Our study of the Gorodtzovian data is suggestive of at least three types of industries which could be defined within basic Gorodtzovian, namely Kostenki 14/2, Kostenki 12/1, and Kostenki 15.

Kostenki 14/2 type

The assemblage shows two raw material groups procured from different sources. The first is local quartzite and the

second one is flint which is partly of local and partly of unknown origin. Quartzite composition includes typical discoid cores. All pieces are unifacial and heavily retouched. The scaling-thinning technique is quite typical. From the morphological viewpoint, there are elongated-oval massive tools - leaf scrapers and endscrapers and short massive implements - scrapers including those of triangular shape. It is worthy to note that only part of the retouched pieces are produced on blanks, while the majority of tools result from other tools by means of intensive reduction, maintenance and resharpening. This is also observeable for a specific composition of Mousterian point and endscraper applied to the same implement. Scaling has been used for tool body thinning but not for working edge reduction. There are several typical fan-like endscrapers.

The lithic assemblage composition is more typologically diverse. Cores are in rare occurrence, although tools made from different kind of blanks (blades, flakes, crests, and tools). There are several massive scrapers which might be used as initial forms for reduction. Many blanks are intentionally fragmented by means of retouched notch technique. Bifacially worked pieces are rare and not identifiable to the morphology. Scaling-thinning technique appears in two variants: flaking and facetting and suggests multipurpose use, such as working edge maintenance and rejuvenation, resharpening and thinning for hafting. In many cases, the scaling-thinning technique has been applied on repeated occasions for morphological and hafting control where reduction is in progress.

The high shaped endscrapers are more common than others and are mostly elongated. Laterally retouched edges are either convergent or parallel. The majority of these tools are explicitly suggestive of reduction which supposedly started from the big scrapers. Rough retouch application allowed any blank including tool-blank to be modified to any type of tool observed in this assemblage. There are many cases in which reshaped tools are not the same axis as their tool-blanks. The high-shaped endscrapers vary depend on blanks selected which are basically the massive removals of cores curation including those of crested preparation. Cores made high endscrapers are missing to the data. Some typical carinated endscrapers appear with elongated proportions and lamellar curation of working edges combined with notches. Blanks used were either elongated tools or big scraper fragments. Fan-shaped endscrapers are probably an output of either the same tool-type reduction or other resharpening. Small high circular endscrapers have revealed an association with high endscrapers as to reduction. At the same time, there are typical and double endscrapers on blades which were used to produce nail endscrapers and casually scaled pieces. The Middle Paleolithic tool kit includes rare Mousterian points and scrapers (simple and canted).

The assemblage under consideration indicates a maximum rate of "Aurignacian" typological components as compared with others of Gorodtzovian affiliation. Such a situation may result from the fact that massive blanks and tools have been involved in curation much more strongly than in other cases. The secondary reduction biases a maximum blank margin to retouching and the same types of curation being used for tool making, resharpening, and reduction. It is worthy to note a slight index of tools that have been worked on prismatic blades.

Kostenki 15

The very first feature of this assemblage is the overwhelming majority of small implements termed Gorodtzovian *pièces esquillées*. These pieces are either one-edge ore two-edges alternately retouched. Typical "Aurignacian" components are absent. The heavily retouched endscrapers, which are common, have been obtained through the reduction of the biggest size tools. Nevertheless, tools resulting from regular blanks are more frequent here. This influenced a more intensive fragmentation, truncation and different kind of working edge composition (endscraper-burin, Mousterian point-endscraper) being applied. Heavily retouched blades are the basic tool sand tool-blanks for subsequent reduction. There are retouched bladelets and those of cross-sections as well as limaces and simple scrapers. Nail endscrapers appear in high frequency, while the "Aurignacian" component is minor.

Kostenki 12/1

In a manner of speaking, it is a more developed Gorodtzovian assemblage than all others associated. Apart from a few carinated burins, "Aurignacian" tools are not present. High-shaped tools appear in low frequency. There is one backed bladelet and one chip micropoint.The regular blade reduction is more expressed than that in any other Gorodtzovian assemblage. Endscrapers are the same types, but not many of them produced by means of reduction.

The reduction, maintenance, and rejuvenation techniques, as stated in our study, influence significantly that the techno-typological idiosyncrasy of both Gorodtzovian and Streletzian. As a matter of fact, the data analysis in many ways should rely on the study of step by step reduction instead of formal typological practice. To the point of "reduction" concept, scrapers will vary based upon resharpening and maintenance, while their morphology states an exact moment of discard but not a predetermined product (DIBBLE 1995). The intensity of reduction will be influenced by raw material availability (DIBBLE *et al.* 1995) and, as we suggest, also by the taxonomic context of the industries. So to assume that intensive reduction is a characteristic attribute of the Middle Paleolithic non-Levallois technology is thus relevant to taxonomic studies.

To the Streletzian and Gorodtzovian data, such types as high endscrapers often resulted from reduction and resharpening of massive scrapers and limaces with maintenance of maximum thickness of tool-blanks. Another Middle Paleolithic technique - thinning - has been used in these industries along with abrupt or semi-abrupt retouch to maintain morphology and hafting accommodation. Likewise, both Streletzian and Gorodtzovian posit many tools that have been made on

regular thin blades in which additional lateral retouching is not needed. In this case, reduction was carried out by means of blank and tool fragmentation.

Thus to conclude, both Streletzian and Gorodtzovian development trends indicate increase in the use of regular blade knapping and replacement of Mousterian tool technology by Upper Paleolithic technology.

Discussion

Any insight to the problem of Middle to Upper Paleolithic transition immediately raises the question of criteria that differentiate the two periods. There are many interesting claims to provide such techno-typological marks as "crested blade preparation" (Yu.Demidenko and V.Usik), criteria of "trimming", and some metric correlations suggested to distinguish Middle from Upper Paleolithic bifacial points (M.Anikovich, B.Bradley, E.Giria). However, when one puts these issues into practice, it becomes clear that they are not workable, especially on the wide geographical and chronological scope. By the same token, the traditional typological criteria as presence/absence of endscrapers, burins, scaled pieces, etc. are no longer in use. It is also possible to look at the Middle to Upper Paleolithic criteria from the point of reduction technology. Those industries of Micoquian tradition which have been referred to as either transitional or Early Upper Paleolithic have intensive reduction and resharpening in common. In other words, they are characterized by many tools that were made into other tools as well as heavily reduced implements. The observed reduction technology frequently comes into focus as a combination of heavy retouch application and thinning-scaling technique. To the Eastern Europe data such a reduction pattern can be seen as an integral part of non-Levallois Middle Paleolithic technologies. The Upper Paleolithic reduction technology basically grasps with blade or tool fragmentation and eventually leads to the appearance of both geometric and non-geometric microliths. This shift has reduced dependence from raw material localities and made a relatively fast dissemination of anatomically modern human possible, where such a technology allowed easy flint transportation. Therefore, the distinctions between Middle and Upper Paleolithic reduction technologies may be also specified in the matter of criteria. However, alongside the criteria described above, this one will work as a tendency with an account to each technocomplex specific features. At is well known, different typological classes of tools have different use-lives and reshaping capacities. The most durable classes are scrapers and bifaces which therefore might be transported over long distances (Dibble, Rolland 1992: 12, Dibble *et al.* 1995). It seems to be a fact that blades and blade tools have the most durable use-life and resharpening capacity, since they could be many times broken and applied to various purposes with no immediate discard. So blade reduction fits best for a mobile economy, especially throughout an unknown landscape. That is why, among others reasons, both Aurignacian and Gravettian came to inhabit the Old World rapidly. Thus the transition from flake tools or biface-based reduction to blade technology, despite the rate of change, is a considerable feature of the Middle to Upper Paleolithic transition. However, these two methods of reduction are quite dissimilar when compared on the basis of only such factors as raw material quality, distance to outcrops, etc. When one considers such transitional assemblages like Mira where flake tools, bifaces and blade-based reduction exist together, the stylistic or cultural factor ought to be called into explanation as well.

The social (i.e. biological and behavioral) factor, as it is indicated in the archaeological record - evidence of cultural complexity, findings of anatomically modern or near modern humans - is not always warranted to segregate Middle and Upper Paleolithic materials, since it takes many forms in archaeological data. Despite the indisputable consistency, the understanding of the Middle to Upper Paleolithic transition as a threshold in which a complex mortuary practice, art, individual ornament, goods exchange and, certainly, oral speech abilities are supposed to be demarcated, the chronological and geographical convergence of all of these aspects is obvious (BINFORD 1989: 477). Arguing for this notion is the fact that the Chatelperronian evidence relates neurological capacity of fully modern behavior to the late Neanderthals (P. Mellars, see: KLEIN 1996). Therefore, the complex data analysis bearing on flexible criteria is valid to grasp differences between what one calls Middle and Upper Paleolithic. It should be especially emphasized that together with the Middle and Upper Paleolithic, the transitional industries vary in many ways (COHEN, STEPANCHUK 1999) and the variability of each case is certainly not based on a simple and uniform explanation.

Both the Near East and the European evidence is in some cases in the form of compositions which compound features of Middle and Upper Paleolithic and thus allow to distinguish the transitional industries. However, not every combination is indicative of this affiliation and it once again to refers us to use flexible criteria. For instance, the Krems-Dufour Aurignacian of Siuren 1 appears with numerous Middle Paleolithic tools total half of the toolkit (DEMIDENKO *et al.* 1998). Such a composition of typical Aurignacian and Middle Paleolithic is a rare occurrence and could be a function a relevant explanation of each specific case. The early Streletzian assemblages and especially Kostenki 1/5 provided bifaces which are well known through the wide area of the Micoquian sites, including those of transitional character, such as Central European Szeletian. Nevertheless, the triangularly shaped Streletzian points occurred in Micoquian industries in exceptional cases, while they are constantly present through whole Streletzian extent. All these factors will support the traditional understanding of Streletzian within the Upper Paleolithic.

The Middle to Upper Paleolithic transition in Eastern Europe does not fit the data of a simple replacement model in the sense of the nearly simultaneous appearance of the Aurignacian and the vanishing of the Middle Paleolithic. The case deals with both local (those are derived from Micoquian) and intrusive (those are rep-

resented by different kind of Aurignacian) populations. The acculturation model has also been suggested as a hypothesis for the problem (COHEN, STEPANCHUK 1999, ANIKOVICH 1999). However, the detailed picture remains as yet unclear.

One could argue that the Streletzian and Gorodtzovian originated with an explicit account for Micoquian ancestry was certainly not a one-moment transformation and might be in the form of a transitional episode. It was influenced by population moves across the landscape and resulted in the appearance of a long distance flint procurement economy with all possible issues for cultural complexity. Such a situation may also result in more complex typology, in the presence of more reduced types and tools which might be produced at one locality and transported over longer distances. It is worth noting that such considerable concentrations of Upper Paleolithic as the Don's Kostenki and Dnieper ridges area have either poor quality local flint or no local flint at all. In addition, these regions have few or no Middle Paleolithic sites. Seeing that there is a dynamic relationship between lithic procurement and other subsistence activities (DIBBLE *et al.* 1995: 260), such a situation will result in the intensive bone working, future planning and all that is referred to so-called complex or modern behavior.

Considering the Middle to Upper Paleolithic transition as a complex and non-unilinear process, one should avoid schematic interpretations. Considering this matter, it becomes clearer that not every transitional industry will lead to the Upper Paleolithic. Likewise, the fact that Streletzian and Gorodtzovian are either earlier or similarly dated to some transitional industries does not necessarily mean that they are not related. It is rather suggestive of a remark that early transitional evidence is not well known to the data.

It is quite reasonable and consistent to suggest that definitions being made from a single site perspective are basically not justified to the data. Thereof one needs more comparative studies with an explicit reliance on taxonomy. It is theoretically clear that both Streletzian and Gorodtzovian have to be rooted to the Middle Paleolithic with bifacial flaking technology (FORMOSOV 1958, ANIKOVICH 1992). Recently there were some attempts to make this idea concrete. So the Upper Paleolithic of Gorodtzovian and Kiik-Kobian para-Micoquian have been genetically linked thorough the Mirian transitional industry (STEPANCHUK *et al.* 1998, COHEN, STEPANCHUK 1999). Another point contemplates the possibility to undertake such genetic couples as the Streletzian and Mousterian sites of Chokurcha, Zaskalnaya 5, Prolom, Trinka 3, and, from the other hand, the Gorodtzovian and site of Il'skaya (ANIKOVICH 1999). Despite the obvious need for additional evidence to support both suggestions, the search for Streletzian and Gorodtzovian roots at the south of the Eastern Europe Micoquian is getting more warrant than even a few years ago. Apparently both similar industries which are the Dnieper's Mirian and the Dniester's Gordineshti represent a late data-link in the development of the Epimicoquian technocomplex. The assemblages assumed to be an early stage of this development are not well known.

The stratified site of Nepryahino could be tentatively described to the early transitional scope of the Epimicoquian technocomplex. The lower layers assemblages (K - I-III) yielded a majority of Middle Paleolithic tools including those of bifacially worked leaf points, endscrapers, and Mousterian points (ZAHARIKOV 1999: 203). The Nepryahino chronology remains undefined. The Stinkovian (Stinka 1, Pilipche XI) (SYTNIK 1999: 190, 191) also appears with some features of the early transitional Epimicoquian industries, namely numerous bifacially worked leaf points, scrapers coupled together with rare high endscrapers.

The Eastern Europe Paleolithic archaeology often argues for the Aurignacian affiliation of any assemblage in which such or other Aurignacian typological feature is found even if it is minimally represented. The evident sample of such method comes from the Prut assemblages study (LEVITZKIJ, BORZIJAK 1999) in which the Aurignacian affiliation was indicated due to the sporadic appearance of high-shaped endscrapers. The taxonomy suggested in this paper otherwise refers the transitional industries of the Crimean, Prut-Dniester, Dnieper, and Transcarpathian groups and early Upper Paleolithic industries of Streletzian and Gorodtzovian to the same Epimicoquian technocomplex bearing on techno-typological resemblance between them and also their possible common origin *(fig. 3)*. It is very likely that the transitional industries will be shown in two-stage periodization as far as the data allow. In a very preliminary view, the early stage provides industries rich in leaf points with rare Upper Paleolithic tools (Stinkovian, Nepryahino, and, possibly, Buran-Kaya, l. C), while the late stage includes industries with frequent Upper Paleolithic tools and rare bifaces (Brynzenian, Gordineshti, Korpach, and Mira). The chronological position of earlier industries is not defined yet. Taking into account all available data, it presumes the interval between 45-40 Kyr and 32-30 Kyr. The late group development basically falls to the Stillfried B interstadial. One can accept that the early transitional industries are comparable to the Central European Szeletian, which is a manifestation of the Epimicoquian technocomplex as well.

The development of the technocomplex of Levallois-Mousterian of Tabun D tradition seems to appear in two phases. The first (the Middle Paleolithic phase) probably began at isotopic stage 8 (TL chronology) or 6 (ESR chronology) and lasted up to the beginning of the Pleniglacial at about 50 Kyr. Then the case deals with transitional industries, which are first found in the Near East roughly between 50 Kyr and 40 Kyr. The transitional appears first at the Negev and possibly at Ksar-Akil, l. XXVI, XXV (MARKS 1993), while later assemblages date between 40 Kyr and 36 Kyr (Uçagizli and Umm El Tlel) (KUHN *et al.* 1999, BOURGUIGNON 1998). The first Ahmarian, which is Emiran origin, comes into focus at about 42 Kyr, while the Levantine Aurignacian A occurred at about 36 Kyr (BAR-YOSEF, BELFER-COHEN 1996). We should argue that the transitional industry of Emiran spread out of south-western Asia to

Balkan as it manifested by Temnata l. VI data. Bearing on an uncertain age of the former, one is unable to define the possible age of this event. As suggested above, the Bohunician at the time of 43-42 Kyr indicates the next appearance of data of this kind of transitional industries, which was probably also caused by a population move. The Bohunician assemblages posit features of both Aurignacian and Epimicoquian (Szeletian) influences and this way is differ from Temnata for example. Seeing that the later Bohunician assemblages are dated to 35 Kyr, it could be the term for the new eastward shift. There is all basic to believe that Kremenician appearance at about 31 Kyr was influenced by such a move. In turn the Kremenician has all typological indications of Aurignacian influences growth. Of course, it is not merely possible to fill in details of the process under consideration as well as to discern a potential enlargement of subsistence or procurement area from what one assumes is evidence of population move. If the date of Kulychivka l. 2 at about 25 Kyr is correct, the Kremenician lasted for long time with no marked differences in technology. As the data suggest, the first move of Levantine Mousterian of Tabun D tradition falls to the Eemian interstadial if the proposed view on Yezupol assemblage is correct. At that moment there is no evidence to connect the Eemian site of Yezupol and the same technocomplex transitional industries in Europe. For this reason, the dispersion of such a striking technological and partly typological homogeneity throughout Europe is more likely explainable from the point of two independent flows of population movement.

Examining the anthropological matter of populations that have been involved in the Middle to Upper Paleolithic transition in Eastern Europe, one must conclude that it is a mostly doubtful problem. It is not excluded that this population appears to be mixed. The anthropological remains of *Homo sapiens* were found at Spitzinian sites of Kostenki 17/2, Gorodtzovian sites of Kostenki 15, 12/1 as well as at the later Streletzian site of Sungir (ANIKOVICH 1999: 121). *Homo sapiens* remains have been obtained in the context of different technocomplexes, namely the Aurignacian and the Epimicoquian. There is no anthropological evidence that could be associated with the transitional industries. It is possible to assume that at least part of them related to Neanderthals. Such a idea becomes warranted in the light of the Western Europe Chatelperronian data in which the transitional industry has revealed an association with Neanderthals (HUBLIN *et al.* 1996). At the same time, one could assume that long-standing development of the Levallois-Mousterian of Tabun D tradition, including its final manifestation at Kulychivka, is suggestive of modern or near modern humans, despite the fact that no items provided fossil remains.

The interpretation of transitional industries from the point of supposed genetic differences between them meets essential returns of processional archaeology. So Kremenician and Mirian variability might be explained by observed distinctions in raw material economy. Indeed, the case of Kulychivka is dealing with so-called procurement site which is located near immediately available outcrops. It influences the overwhelming mass of debitage by-products, limited typological set, and minimal reduction. Otherwise, the Mirian is almost totally based on long distance flint procurement and, therefore, shows a typological complexity, the presence more reduced types which were probably used in many purposes. Nevertheless, we are encouraged to think that these differences cannot be solely responsible for such a remarkable technological and typological variability. It was rather a function of complex interaction of both ethnological (genetic) and behavioral factors. The best evidence to support the idea comes from Kostenki Paleolithic cluster. As it well known, this area has no good quality row materials, and each site provides a complex combination of local flint and quartzite together with lithic that was probably procured far away from the area. However, every deeply stratified site indicates a wide-scale of techno-typological differences which therefore apparent within the same or almost the same row materials strategy.

The above analysis focusing on taxonomy gives an entirely new perspectives on the nature of the Middle to Upper Paleolithic transition throughout the Eastern Europe. It is true that the model provided by this paper is not always relied yet on well documented and indisputable evidence. Nevertheless, the available Eastern European data are consistent in suggesting of more complicate multi-dimensional model than that is proposed by the replacement concept.

Acknowledgments

We should like to thanks A.E. Matiuhin and A.A. Synitsin for permitting us to look at the Biruchiya Balka and Kostenki XIV materials and certainly for profitable discussions about the Middle to Upper Paleolithic transition.

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