



NEOLITHIZATION OF THE CRIMEAN MOUNTAINS (current stage of investigations)

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INTRODUCTION

First ideas about Neolithic of the Crimea were formed during thirties of this century (BIBIKOV, 1940). Main archaeological sites were excavated in 50-60 years. Until recently these data have kept significance for investigations (KRAINOV 1960; FORMOZOV, 1962; CHEPINSKI, 1968; DANILENKO, 1969; TELEGIN, 1987; MATKEVOY, 1977; KOLOSOV, 1985; YANEVICH, 1987; KOZLOWSKI, 1989). However, some parts of these evidences have doubtful origin under condition of stratigraphical position first of all. For this reason we tend to involve mostly reliable data. So the publication of these old materials and new assemblages as well may be estimated as a background for subsequent subsequent studies. Thus, title "current stage of investigations" completely reflected transition character of this paper.

GEOGRAPHICAL FEATURES OF THE CRIMEA

The Crimean peninsula is formed by a compact and well defined geographical region. Final Pleistocene-early Holocene palaeoecology of the Crimea firmly connected with Late Quaternary history of Southern sea of Europe. In accordance with stratigraphy of sea's deposits, both periods (13-10000 unc. BC - beginning of postglacial transgression and 7000 unc. B.C. - beginning of water level stabilization) can be seen as climatic options for this territory (SCHERBAKOV *et al.*, 1977, s.52; FEDOROV, 1977, s.30). It seems likely that modern landscape structure of the Crimean

peninsula was formed to the end of Boreal-beginning of Atlantic periods.

The Crimea take up 27000 km² area. 257 small rivers flow to Azov and Black Sea basins. The structure of landscape consists of flat and mountainous parts. This last (6000 km².) is a part of East Mediterranean mountain system. The plain located on the Scythian platform which once underlain of Black Sea coast Lowland.

Crimean Mountains comprise three ranges: first (or Main) - up to 1547 m, second till 740 m and third (or external) up to 350 m above sea level. Eastern part of the Crimea and Kertch area both have a specific geographical conditions as well (Fig. 1). Actually, final Paleolithic-Mesolithic hunter-gatherers subsistence depended on wild biological resources local distribution in the framework of each landscape system (COHEN, - in press). The influences of landscapes must be also recorded in Neolithic settlement patterns.

The distinctions between steppe and mountain vegetations must be taken into account in Preboreal and Boreal periods. So palynological series from Kertch peninsula sites represented pollens of bush-grassy vegetation (98%) (MATSKEVOY, PASHKEVICH, 1973, s.128). The Mountain regions were covered oak-tree forests, except Plateau of the First Mountain belt (GAMMERMAN, 1934; COHEN, 1994). Some Mountain Mesolithic sites yielded fish remains. Viewed from biological descriptions of these species, Crimean rivers were flowing differently than today (LEBEDEV, 1952, s.48 50). However, climatic conditions become arid during early Atlantic must be recorded in accordance with snail shell reducing in the structures of Neolithic sites. These evidences agree with general evaluations of early stage Holocene optimum in Southern part of Eastern

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Europe (8-6000 cal. BC) (ZWELEBIL, DOLUKHANOV, 1991, p.243-248). The Neolithization of the neighboring steppes of Pontic Area developed on the background of climatic amelioration. Spreading of trees associations along valley of rivers and formed by wide grazers must be recorded as different from Preboreal-Boreal environment where open steppes landscape dominated (PASHKEVICH, 1981; STANKO, 1992, p.23)

I. Mesolithic of the Crimea (brief approach)

The lithic assemblages of the Crimean Mesolithic, the most durable and common artifacts remains of the prehistoric people of the region, display obvious and marked typological differences especially among the geometrical microliths.

The development of cultures with geometrical microliths took place during final Pleistocene-early Holocene climate fluctuations. The final Paleolithic of the Crimea is represented by two cultural phenomena: Shan-Kobian and Siuren cultures (COHEN, 1993, 1994, 1995). In accordance with radiocarbon evidences, early Shan-Kobian assemblage (Rock Schelter Skalistiy, I.III/3) is enclosed in chronological frameworks of Dryas II and Alleröd interstadial (12820 ± 170 BP-OxA-4888; 11.750 ± 120 -OxA-5165). Upper data of this culture agree with chronostratigraphical data middle Preboreal. The assemblage of Siuren II (lev.1.) is not yet dated. The age of Dryas III must be recorded viewed to typological and stratigraphical comparisons (COHEN, 1993, 1995).

Kukrek culture

Developed knapping technique for special inserts on cross-sections with ventral flat retouched flakes, burins and cores with volumetric reduction, scarcity of geometrical microliths outlines features of Kukrek lithic technology (BONCH-OSMOLOWSKI, 1934). The Mesolithic Kukrek assemblages were widespread along some landscapes areas : Coast, First and External Mountains regions.

Sites with Kukrek tool kits spread in the Southern part of Eastern Europe as well as forest region, Pontic steppes and Dnieper valley. In accordance with one estimation, all of them belong to Kukrek Culture (STANKO, 1982; TELEGIN, 1982). Another point of view, defined them like a totality of kindred

cultures : Kukrek of the Crimea, Kukrek of the Kamennaya Mogila, Pontic Kukrek and Igren cultures (COHEN, 1993).

In accordance with chronostratigraphical data from Vishennoye site three stages periodisation of Crimean Kukrek were recorded : Early Mesolithic, Middle Mesolithic and Neolithic (YANEVICH, 1987, s.10-17). This relative chronology is without reliable radiocarbon data. So, the main concentration of radiocarbon data from Kukrek site enclosed in the frames of VII mil. unc. BC. Several evidences fall to 9.600 ± 150 unc. B.P. (TELEGIN, 1982; Kozłowski, 1989). So, currently there are not enough reason to designate a Late Glacial age for early Kukrek culture. The estimation of Neolithic age in Kukrek development requests a carefull approach. The assemblages of this group contain both Kukrek inserts and geometrical microliths with flat retouch (see below).

Previously the functional fixing of "Kukrek type inserts" was treated as components of bone points (BONCH-OSMOLOWSKI, 1934, s.161). Hence, peculiarities of hunting was as indicator of Kukrek ethnicity with obvious character as distinct from hunters with bow and arrows from neighboring cultural environments (MK-culture, Grebeniki, Janislawice). Modern micro wear studies recorded Kukrek incerts function like composites of knives for tree cutting (SAPOZNIKOVA, SAPOZNIKOV, 1992.s.3-7). Thus, on the modern stage of investigations, economy treats of Kukrek entity don't agree with ethnic estimations.

Murzak-Koba culture

The MK was formed consequently on cultural transformation process during the middle of Preboreal. The MK industries bear together typological features of some prior cultural phenomena: Shan-Kobian (Azilian segments points like, trapezes), Siuren (leaf points), Shan-Koba, I.4 (microgravette points, backed blades), Vishennoye (backed points with truncated base). The new typological evidences occurred as well (Fat'ma-koba points, Tardenoizian and Capsian points, typical trapezes and others). The changes were due to objective regularities of technique development as well (microlithisation). In MK assemblages these processes achieved to extreme point of development.

The main MK multilayer sites are located inside the Mountain belt. Rethinking of stratigraphy and sites structure of these settlements allowed to propose new understanding of Murzak-Koba culture development (COHEN, 1993, 1994; BIBIKOV, STANKO, COHEN, 1994). The MK is heterogeneous cultural phenomena which once connected two types of industry : Fat'makobian (early and late) and Shan-Kobian (early and late). First group incorporate Fat'ma-Koba, 1.4, Murzak-Koba, 1.III/3, Shan-Koba, 1.III/3, Fat'ma-Koba, 1.2, Murzak-Koba, 1.III/1, Laspi VII. Second group consists of assemblages from Shan-Koba, 1.III/1, Fat'ma-Koba, 1.3, Murzak-Koba, 1.III/3, Zamil-Koba I, 1.1, Alimovskiy rock shelter, 1.2, Shpan-Koba, up.1.

The high level of knapping technique development characterized early Fat'makobian industry (Murzak-Koba, 1.III/3, Fat'ma-Koba, 1.4). All points and geometrical microliths were manufactured on microblades. End scrapers are more numerous than burins. Points predominate over geometrical microliths.

Points formed three typological taxons: with truncated base, with untruncated base and few tanged points. Double oblique points, Fat'ma-koba points, Azilian points with truncated base and Capsian points can be seen into affiliation of specific types.

Opposition from described above, late Fat'ma-koba industry yielded a high quota of geometrical microliths (Shan-Koba, 1.III/0, Fat'ma-Koba, 1.2, Murzak-Koba, 1.III/1, Kara-Koba, Laspi VII). The group of points represents Capsian, Fat'ma-koba and Tardenoisian implements. These last occurred in the MK sequence in the first time what is good feature for the late Fat'ma-koba typological horizon.

Shan-Koba industry of MK culture has a simple structure for the reason of not numerous quota of points. The specific points for Fat'ma-koba industry are missing here. Typical trapezes (Greibeniki type) compose the main class of microliths.

In the late MK assemblages of shan-koba industry (Shan-Koba, 1.2, Alimovskiy, 1.2) we can recognized a first occurrence of some Mediterranean Neolithic technology (trapezes with pressure technic) what entitle to connect this horizon with beginning of Neolithization

process in the technological mean of this notion.

The MK culture represents impressive bone industry (points, harpoons, decorations etc.). As it was proved befor, the presence of developed bone industry is one from decisions feature of Protoneolithic Mediterranean model adoption (Shela Cladovey, Castelnovian, Igren, Mirnoye) (KOZLOWSKI, 1987; COHEN, 1994, s.9).

The MK culture periodization was built in accordance with interstratification phenomena where both type of industry were superposed : I stage - early Fat'makobian, II stage - early Shan-Kobian, III stage - late Fat'Makobian and IV stage - late Shan-Kobian.

Radiocarbon evidences about MK culture are not suffisiant yet. So, data from upper level of Shpan-Koba (8.240 ± 150 unc. BP "GIN-6277" (Yanevich, 1993) could mark a second stage. The third MK stage is enclosed in the frames of VII - beg. VI unc. mil. BC viewed from Laspy VII radiocarbon series (see TELEGIN, 1982).

In the last analysis three stages of MK culture were enclosed between 7500 -6000 unc. BC and the fourth stage - 6000 - 5500 unc BC (COHEN, 1994).

Shan-Koba, 1.IV culture

The subsistence strategy of Shan-Kobian and MK cultures provided different systems. On the last stage of Shan-Koba development the change of spatial features must be recorded (COHEN, in press). It offer the reason why the direct stratigraphical transition between Final Paleolithic and Mesolithic in the Crimea doesn't represent the stratigraphical sequences of multilayer sites. In some cases, not numerous assemblages of Shan-Koba, 1.IV culture (another name - Shpanskaya) posed this stratigraphical time-span. So, Shan-Koba, 1.IV, Shan-Koba, 1.III/3 low.hor., Shpan-Koba, mid.I. can be seen into affiliation of this culture (COHEN, 1993; YANEVICH, 1993, s.3-14). The tool kits of this industry contain obvious final Epigravettian components : backed blades, low asymmetrical triangles, gravettes and microgravettes and usual crescents as well. In the middle level of Shpan-Koba, A.Yanevich recognized numerous points with microburin technique.

Shan-Koba, I.4 culture existed in the Crimea comparably short time during two stages of development (the middle - second half of Preboreal). The radiocarbon data from Shpan-Koba m. 1. (9.150 ± 150 unc. B P) supports this conclusion. In spite of existence of different evaluations in Shan-Koba, I.4 typological attribution, authors argued origin of this culture in the environment of South European Epigravettian. Within the broad context of this entity, most closely analogies referable to Voloshskiy and Vasilievskiy cemeteries inventory (COHEN, 1993; YANEVICH, 1993). Three radiocarbon dates from Vasilievka III (near 10000 unc. B P - JACOBS, 1993) indirectly supports this idea.

The Pontic steppes in the beginning of Holocene were used like a passage for different populations (KOZLOWSKI, 1989). Some part of them could be assimilated in the Crimea.

Thus, final Paleolithic and Mesolithic of the Crimea represents a totality from different cultural entities. However, to the beginning of VI mil. BC both cultural phenomena (MK and Kukrek) were recorded on this area.

II. Neolithic sites of the Crimea

Shan-Koba rockshelter

The site is located in South-Western Crimea in Kubalar - Dere valley (Fig. 1). Rockshelter was completely excavated during 1928, 1935-36 years field seasons (BIBIKOV, STANKO, COHEN, 1994). The Neolithic assemblage (I.1a) was selected by S.N. Bibikov in accord with common position of pottery and trapezes with flat surface retouched and crescents with pressure retouch inside one culture layer (BIBIKOV, 1940).

The Neolithic layer dispersed along south-western part of rockshelter only. The paleographic structure enclosed 12 not deep round-shape pits.

The analysis of archives recorded mixed position of some materials from these excavations. For example, decorated pottery from layer Ia (see BIBIKOV, 1936) belongs to Bronze Age without any doubt.

Flint assemblage include 118 specimens (Table.1). Trapezes subdivide into typical (with abrupt retouch) and with flat retouch on

surface (pressure technique). The availability of two bifacial points was recorded at a late age of this industry.

Inside the bone industry we can recognize fragments of pork (Fig. 2, 8, 11), soft hammer or bone pressure (Fig. 2, 12), fragment of bovine cranium with traces of cutting (Fig. 2, 9), bone perforators and awls (Fig. 2, 1, 7, 10).

The pottery of this level is rare. In this case, we are dealing with 15 small fragments of vessels with comb or undecorated.

The second cultural level of Shan-Koba was imbeded inside yellow clay deposits with some gravels mixture. Cultural remains connected with fire place (1, 1 m. d.). There are no doubt that pottery is not represented in this level.

Flint assemblage consist of different classes of specimens (Table.2). Knapping technique is based on low angle cores. Retouched blades predominate among tools (indirect, simple and denticulate retouch). Big flake end scrapers predominated. Geometrical microliths consist of trapezes only. Microlithic and middle-size trapezes compose a group with "abrupt retouch".

For the first time, "Alimovskiy type" of trapezes occurs in the lithic composition of MK industry (3 sp.). This type includes middle and big-size trapezes with sloping retouch which were formed with pressure technique without solid flat retouch on surface (COHEN, 1990). This definition was embedded for typological structuralisation of preceding model of Crimean Neolithic Technology (see KOLOSOV, 1963; MATSKEVOY, 1977).

Rockshelter Alimovskiy

This multi-layers site is located in South-Western Crimea in Alim's valley on the right bank of Kacha river. The excavations conducted by A.D. Stolyar were on the northern part of the rockshelter. Stratigraphical sequence consisted of four layers. The cultural determination of these assemblages is the subject of long term debates. For example, chronological estimation of first layer has a fluctuation between Upper Mesolithic and Copper age (STOLYAR, 1961, s.38-44; FORMOZOV, 1962, s.114; SCHEPINSKI, 1985).

The industries of I.II and I.III both represented "Alimovskiy type" trapezes. So, these assemblages are referable to fourth stage of MK culture.

The cultural remains of the first layer were concentrated inside the structure with fire places, ashes and burned soils. The pottery was not found here. The knapping techniques were based on volumetric or semi-volumetric cores with one or two platforms and low angle core as well. The geometrical microliths were the main class of tool kit (69-80%) (Table 1). Trapezes are more numerous than other types. "Alimovskiy type" predominates among them (Fig. 3, 2, 3, 9, 10, 11-13, 15, 19-29, 31-33, 37-40). There are some crescents with pressure retouch technique (Fig. 3, 35). So, viewed from stratigraphical and typological data, the first layer of Alimovskiy is finally close to Shan-Koba, 1.2.

At-Bash

It is the open air site on the Plato of the Main Mountain range (Fig. 1). Flint assemblage and fragment of sharp-base vessel located in yellow clay deposits. The structure enclosed fire place with circle of stones around (ZIROV, 1927; BADER, 1940; FORMOZOV, 1962). It is likely, that At-Bash structure connected with dwelling remains.

Flint assemblage include 225 tools (FORMOZOV, 1962, s.97, 98). "Montbani" blades and bladelets are main type of blanks. Primary retouching based on semi-volumetric and low angle cores. All of these cores represented a residual shapes. This feature has a bearing on all coastal and Mountain Plato sites where outcrops of raw materials are missing.

End scrapers are the most numerous category amongst tools (133). End scrapers on blades are predominated (85). Micro endscrapers and circular compose a wide series. Burins technique doesn't developed.

Trapezes are the main class of geometrical microliths in At-Bash. The majority of them are typical trapezes with abrupt retouch. The group of microlithic pieces with pressure technique consist of trapezes with flat retouched surface (1 sp.), "Alimovskiy" (18) and crescents (8). Typical crescents must be recorded also (19).

The series of data leads to the conclusion that At-Bash is an essential assemblage for early-pottery stage definition of the Crimean Neolithic. The increase quota of pressure technique in the primary and secondary retouching of At-Bash lithic industry and occurrence of shape-base pottery with plants admixture comprise the main innovations by contrast with assemblage of Shan-Koba, 1.2. It is obvious that both assemblages have a connection with genetic and chronological notions. The fauna from At-Bash represents wild species (roe deer, wild board and red deer) (see Table 2).

Kaya-Arasi

This open air site is located in Kacha valley (South-Western Crimea). The stratigraphical sequence contains two cultural levels : 1 - Kizil-Koba culture (Bronze Age), level 2- Neolithic (FORMOZOV, 1962, s.105-109) connected with limit between humus horizon and brown clay sediments. In accordance with estimation by A.A.Schepinski, upper horizon of this sequence enclosed Chalcolithic materials. Sometimes both Chalcolithic and Neolithic remains are located on the one living surface (SCHEPINSKI, 1985). The data analysis doesn't confirm the existance in the Crimea of homogenous Copper Age horizon with bifacial points (see below). Viewed from stratigraphical and typological data from Kaya-Arasi, cultural innovations (thin-wall undecorated pottery and bifacial points) occurred inside one population in the frame of well defined time segment.

The pottery from Kaya-Arasi consists of two classes : 1 - (early) - sharp-base vessel with drawn lines and pins ("Surskoy type") and 2 - (late)- thin-wall undecorated vessels with flat base ("Kaya-Arasi type"). In a lot of cases both types of pottery were found together.

Flint assemblage contains 3000 artefacts and 150 tools. The techno-typological traits of cores are typical for the Crimean Neolithic - combination of semi-volumetric and low angle cores reductions. Cylindrical-shape cores are not represented. The quantity of trapezes with abrupt and flat retouches is nearly the same. All the crescents (15) were retouched by pressure technique. The Kukrek typological component is not represented here,

as Shan-Koba and Alimovskiy as well. The fauna embraces wild species excepted board.

Rockshelter Tash-Air I

This is a multi-layers site in the Kacha valley inside the External Mountain belt (Fig. 1). It was studied by D.A.Krainov during 1938, 39, 40 field seasons on a 300 m² area. Materials of this site were published as "a base for periodization of Postpaleolithic cultures in the Crimea" (KRAINOV, 1960).

The stratigraphical sequence is divided into two separate groups of deposits: 1.-above "collapsed horizons" (lev.-IV) and 2. - under "collapsed horizons" (Va, Vv-IX). Despite on disagreements in evaluation of Tash-Air I stratigraphy (KOLOSOV, 1963, 1985; FORMOZOV, 1977) these materials keep a high cognitive capacities.

In accordance with living floors structure, there are sterile soils between horizons; constantly some of the fauna I.IX-V.v have a meaning on seasonal occupations.

Flint remains from I.IX are not numerous (201 sp.). Geometrical microliths are absent. The presence of domestic pig bones allows the restriction of the chronological position of this level - not early than IV-th stage of MK Mesolithic culture.

The lithic inventory from I.VIII includes rare geometrical microliths (7): crescents with abrupt retouch (3) and two types of trapezes ("Grebeniki" and "Alimovskiy") (KRAINOV, 1960, table.IV, 4, 6).

The materials from I.VII represent homogenous assemblage of geometrical microliths (16): crescents (4) and trapezes (12). The latter were divided into two types: with sloping retouch or with abrupt retouch. Flat trapezes were absent. Obviously, this level occupies a transitional place between Shan-Koba and At-Bash sites.

In I.VI first occurrence of pottery could be recorded in relevance to stratigraphical sequence of Tash-Air I. We are dealing with 11 fragments from one vessel. The archaic pottery from I.VI can be seen in affiliation with At-Bash type.

Geometrical microliths represents an usual typological structure: crescents (4) and

trapezes (9). These last enclosed "Grebeniki" and "Alimovskiy" types.

In our opinion, the materials from level Va were mixed during excavations. At least, it contains a Chalcolithic admixture. For this reason, stereotype estimation of developed stock-breeding economy concerning the Crimean Neolithic has long been in the literature.

Levels VIII-VI of Tash-Air I belong to one cultural tradition during the early stage of the Crimean Neolithic.

Martinovka

This open air site located in the steppe regions of the Crimea (Fig. 1) (SCHEPINSKI, CHEREPANOVA, 1969). This site is interesting, since the clear position of its cultural level. The excavation were conducted on the 100 m² area.

The pottery consists of numerous small fragments of gray color with quartz admixture in the clay. Trapezes (17) dominated among geometrical microliths. There are five trapezes with surface retouched by pressure also. The wild species only belong to fauna of this site. The majority of steppe species must be recorded (Table.2).

Petrovskaya Balka

This open air site located in the Petrovskaya valley inside of modern Simferopol (Fig. 1). This valley has a lot of springs and favorable geographical situation in common. The lower part of this valley extends to confluence place of two rivers: Big Salgir and Small Salgir (5 km radius). It is a beginning of wide lowland which once spread to the steppe (10 km radius). The second Mountain region and northern macroslope of the Main belt were available along the Salgir valley; this site comprise very riche nuclear zones and site catchment area enclosed some landscape systems.

The excavations were conducted by S.V.Gumashiyan during 1985-86 field seasons.

Excavation of year 1985

The excavation area distributed over 80 m². The Neolithic level embeded in the lower part of loam deposits (0, 12 m). (Fig. 4). The Bronze Age level was superposed in the

humus. So, both these levels were divided into separate parts and sterile deposits between them on the base of 1985 year excavation.

The culture remains were spread along excavation area unequally (Fig. 4).

Aggregation "A" - (B-3, 4, 5) and (V-3, 4). It has oval-shape (5-7 m²). The structure enclosed fire place, wastes from food and production.

Aggregation "B" - (B-7, 8, 9) and (G-8). Cultural remains composed a strong concentration. It has incorrect round-shape (2 m²). The structure contains wastes from food and production and embankment from clay.

Aggregation "V" (G, D, E-9-11): - has incorrect round shape (3-5 m²). The small and used bones composed a main part of this aggregations. The small pit was studied on this lot. The pit was over of crushed bones and flint. The thin layer from shall snail *Helix* covered a pit base. So, this aggregation structure enclosed wastes from food and production, embankment from clay, pit and two concentrations from stones.

Excavation of year 1986

The excavation area covered 300 m². Stratigraphical profiles cut on these loci of the settlement didn't show sterile deposits between upper and lower levels (Fig. 4). However, Neolithic and Bronze Age levels belongs to different geological deposits (color and structure).

The dwelling structure with dug out floor was partly excavated in this field season (K, L, M-11-14). The bottom located under ancient surface (0, 6-0, 7 m deep). The deposits subdivided into three microstratigraphical horizons inside of this structure. First horizon (floor) contained the pottery remains, crushed vessel and red clay concentration. Second

horizon (middle part) included a concentration from peaches of burned clay. Upper horizon was recognized follow to small fire place location (Fig. 4).

Viewed from strong concentration of culture remains around dwelling, it was a central place of Neolithic settlement in Petrovskaya valley.

The distribution of cultural remains along the surface formed two main parts: northern and southern (Fig. 4). First part connected with "A", "B", "V" aggregations; second, with the dwelling structure.

It is seems likely that all structures of this settlement were not in use simultaneously. So, analysis of pottery distribution shows high percent of undecorated pottery in southern lot around a dwelling structure and decorated pottery to extent of northern lot. Lithic industry distribution has not features of variability. Obviously, southern part of settlement is older than northern part. The stratigraphical data confirm this idea. Nevertheless, the chronological destinations reflect development of one local population during existing of some generations. Thus, it is quite reasonable to suppose that spatial and typological evidences from Petrovskaya Balka place this settlement to the well defined and homogenous chronological time-segment.

A numerous collection of animal bones were selected during the excavation (2355). Most of them are unidentified small bones. The fauna analysis conducted by V.I.Bibikova, recorded the absence of species with biological features of domestication (Table.2).

The radiocarbon data received for Petrovskaya Balka settlement are the following :

N.1	4530 ± 40 BP	(Ki-2931)	cal. 3342-3108 BC	shell
N.2	4470 ± 50 BP	(Ki-2932)	cal. 3328-3034 BC	shell
N.3	4410 ± 50 BP	(Ki-2979)	cal. 3090-2924 BC	shell
N.4	4670 ± 80 BP	(Ki-2981)	cal. 3620-3354 BC	bone

These evidences assign this assemblage to the end of IV-th mil. cal BC.

Lithic assemblage

Lithic inventory is well-defined and comprises numerous remains on this settlement (7450 sp.) (Table 1). The assemblage consists of knapping products and retouched pieces. Cores (68-0, 9%) are subdivided into three classes: prismatic (51), discoid (7) and preformed (10) (Fig. 5). Cores with one striking platform are mostly numerous (37). In accordance with morphological marks this group can be described as follows: semi-cylindrical (7), conical (12), low-angles (11), cubes (3) and cores with narrow flaked surface (7). All of them are results of volumetric and semi-volumetric core strategy adoption, except low angle cores (Fig. 5). Usually, the shape of these cores depends from reducing degree. The primary retouching of this industry indicates Montbani blades producing. The combination of blow and pressure techniques lead to high quality Montbani blades with different metrical features. So as distinguished from Mesolithic industry where is not represented pressure technique, the Montbani blades and bladelets production achieved during the whole knapping process. This important innovation promoted the extinction of geometrical microliths composition.

Tools compose 7% from all assemblages (Table 1). Endscrapers and microliths both represent numerous categories. Flake endscrapers (52) are more than endscrapers on blades (38). Usual endscrapers (21), unguled (7) (Fig. 6, 1-6), semicircular (18) (Fig. 7, 5-12) could be recorded. The endscrapers on blades represents two reduced subgroups (16) (Fig. 6, 26-36) endscrapers on broken blades (22) (Fig. 6, 7-25). The production of endscrapers in this industry is up to combination both narrow and broad endscraper fronts (Fig. 6; 7). It is necessary to stress that pressure technique was used as well in the secondary retouching of these tools as a distinct from Mesolithic and Early Neolithic industries.

Retouched blades (137), flakes (20) and cross-sections (8) belong to separate groups (39%). It is the most numerous class in Mesolithic assemblages as a rule (more than 50%). The changes were due to total prevalence of Montbani blanks, which can be used without secondary retouching.

The class of inserts in strictly notion of this term enclosed one Kukrek insert only and backed blades (Fig. 8, 31, 32, 34-36; 9, 26).

The geometrical microliths can be clearly estimated as a main class of Petrovskaya Balka industry (36%) (Table 1). The typological variety and standardization both are inherent to this assemblage. Entirely, it leads to the conclusion that progressive evolution of these industries was due to hunter-gatherers way of life duration.

Trapezes are the most numerous category (29%). Microliths with abrupt retouch predominated (63) (Fig. 8, 12, 14, 18; 9, 1, 5, 7). Some of them have retouched base (Fig. 8, 10, 13; 9, 6, 8). Typical high and microliths (9) trapezes can be recorded (Fig. 8, 7-9, 23). It is possible to outline a specific traits of "Alimovskiy type" of trapezes: big symmetrical (14) (Fig. 10, 3, 4, 7, 8, 10, 16-19), big asymmetrical (7), middle asymmetrical and symmetrical (2), low symmetrical (11) and asymmetrical (8) and symmetrical with a short base (8).

The trapezes with retouched surface are comparatively not numerous (14) (Fig. 9, 20, 21; 10, 36-42).

The crescents (6, 1%) comprised microliths with abrupt retouch (9), sloping retouch (12) and flat as well (Fig. 8, 26-30; 9, 23, 24; 10, 1-5, 31-35). The burin spall technique was used in the shaping process almost always (Fig. 10, 10, 14, 0, 28, 30).

The points (5, 6%) are subdivided into two classes: non geometrical (14) and geometrical (16). First category enclosed some unifacial and bifacial points (Fig. 8, 44, 45), point with oblique retouched truncation and convergence (9) (Fig. 8, 37, 38, 40, 41, 43).

The geometrical points can be summarized as follow: Fat'ma-Koba points (6) (Fig. 8, 2, 3), Capsian points (6) (Fig. 8, 1, 5) and triangle point with a single beveled base (Fig. 8, 4).

Thus, the assemblage from Petrovskaya Balka represents a broad spectrum of typological taxons. Together with typical Neolithic specimens (low angle cores, trapezes and crescents with pressure flat retouch, bifacial points), both Transitional (trapezes of Alimovskiy) and Final Paleolithic -

Mesolithic types must be recorded. This last category comprises azilian segment like points, convergent forms, burins of Skalistiy type, chisels (Shan-Kobian); conical cores, typical trapezes, Fat'ma-Koba and Capsian points (MK culture); backed blades (Shan-Koba, I.4). There is no doubt, that coexistence of these difference taxons reflected specific development of cultural tradition but no stratigraphical disturbances.

The fragments of pottery from Petrovskaya Balka belong to 15 vessels. The clay enclosed a crushed shell admixture. Two classes of ceramic can be recognized here: vessels with flat-base (12) - undecorated pottery and sharp-base vessels (3) with comb stamp. In accord with data from Kaya-Arasi and At-Bash, the second group is older than the first.

Fat'ma-Koba "ground"

This open air site located in the Second range of the Crimean Mountain in the Kubalar - Dere valley (Fig. 1). The cultural remains are distributed along the ground in the front of Fat'ma-Koba rock shelter. The excavation were conducted by Yu.G.Kolosov on the 200 m² area during two field seasons - 1958, 1959 years.

The Neolithic assemblages connected with three stratigraphical horizons: I. "black deposits" - 0, 2-0, 8 m (1 and 2 cultural levels), II. "brown deposits" - 0, 1-0, 6 m (3 cultural level) and III. "white clay" - without cultural remains.

Lithic assemblage of I.3 (Table.1)

The knapping products are most common of this assemblage (67%). In the serie of prismatic cores (18) we can select conical shape cores (Fig. 11, 4, 5, 7), bipolar cores (4) (Fig. 11, 2), low angle cores (3) (Fig. 11, 1, 8) and semi-cylindrical cores (Fig. 11, 9).

The secondary retouching of this assemblage is diverse: burin blow technique, retouch and pressure retouch (Fig. 12; 13) and scaled technique. Endscrapers (7, 7%) are more numerous than burins (4, 4%). Endscrapers on blades were formed by semi-abrupt and sloping retouches (Fig. 12, 1, 10, 16). The pieces with broad front predominate among endscrapers on flakes (circulars (Fig. 12, 5) and semi-circulars (Fig. 12, 2, 7, 11, 12)). "Kukrek type" of inserts (Fig. 13, 14), axes (2) (Fig. 12, 13), borers (2)

(Fig. 12, 23) and chisel (Fig. 12, 27) lead to a special attention among isolated tools.

The geometric microliths represent a numerous serie (4, 7%) (Table.1). We can recognized usual typological structure for the Late Neolithic industries of the Crimea. It is a combination of "Alimovskiy" trapezes (20) (Fig. 13, 8, 19, 20-23, 26, 27, 37, 38), trapezes with abrupt retouch (Fig. 13, 1-3, 7, 9, 40) and trapezes with retouched surface (11) (Fig. 13, 41-51) as well. Crescents represent usual typological structure (Fig. 13, 17, 18). Points are subdivided into some classes: bifacial points (2) (Fig. 13, 53), non geometrical (5) (Fig. 13, 11) and geometrical (4) (Fig. 13, 10, 12, 13).

So, viewed from Fat'ma-Koba I.3 "ground" typological treatments, this assemblage can be seen in affiliation of Petrovskaya Balka chronological horizon (Table.3).

Flint assemblage of I.2

The excavation of this level yielded a broad collection (3582 sp.). (Table.1). The soft hammer and punch were used in the primary and secondary retouching. Two specimens such as hammers on roe deer horns and wild pig canon bone are recorded here.

Cores with one striking platform are subdivided into: unvolumetric prismatic (11), conical, cores with narrow flaked surfaces (4), wedges like (1), semi-cylindrical (4) and keel like. Bipolar cores represents usual shapes.

The main category of retouched tools are Montbani blades (41, 4%). The variety of retouch technique can be summarized as follows: dorsal and ventral retouch (Fig. 15, 42, 48), blades with heavy alternate retouch (Fig. 14, 25), combined retouch (Fig. 14, 26; 15, 53), denticulate retouch (Fig. 14, 21, 39, 41; 15, 49, 50; 16, 34) and pressure retouch (Fig. 16, 44).

The endscrapers on blades consist of typical pieces (9) (Fig. 15, 35; 16, 35) and double endscrapers (5) (Fig. 14, 43; 15, 34). The implements on the flakes are mostly numerous (26): endscrapers on the flakes (9) (Fig. 14, 42, 45; 16, 33, 40, 46), double flakes endscrapers (5), nails (1) (Fig. 14, 23), semi-circles (11) (Fig. 15, 37, 39; 16, 40), circles (7) and endscrapers on retouched flakes (5) (Fig. 14, 45).

The trapezes are the most represented class among geometric microliths (Table.1). First of all, trapezes with abrupt retouch (46) (Fig. 14, 6, 10; 15, 10) and microlithic trapezes (Fig. 14, 1-5; 15, 1-9) must be recorded here. Some of them have additional retouching in the burin blow technique (Fig. 15, 6). The "Alimovskiy type" represents typical implements (Fig. 14, 9; 15, 15; 16, 10-16, 25). The trapezes with flat retouched surface must be recorded also (Fig. 14, 11; 15, 21, 28, 29, 30; 16, 2-16). The presence in this assemblage of the "Alekseevskaya zasuha" type of trapeze draws a special attention (Fig. 15, 22).

Crescents were formed in the same technique like trapezes: with abrupt retouch (4) (Fig. 15, 12; 16, 19), with sloping retouch (1) (Fig. 16, 21) and with flat retouch (3) (Fig. 16, 20).

It is possible to infer the point typological variety as a one of the main features of this industry. The typological destinations may be summarized as follows: I. not geometrical points - with oblique retouched truncation (15) (Fig. 16, 29), point with truncated base (Fig. 14, 17), gravette (2) (Fig. 14, 19, 20), convergence (2) (Fig. 16, 41); II. geometrical points - micropoints of "Fat'ma-Koba" type (5) (Fig. 14, 14, 15; 15, 23), Capsian (Fig. 15, 26), with double oblique truncation (Fig. 16, 1) and triangular point with truncated base (2) (Fig. 15, 24, 25).

The stratigraphical position of Fat'ma-Koba I.2 "ground" is recorded at a late age relevant to assemblage from Petrovskaya balka.

Lithic industry from I.1

The techno-typological indicators of this industry are entirely the same as in below levels (Table.1). Various types of retouch must be recorded here: dorsal, ventral, denticulate (Fig. 17, 54) and others (Fig. 17, 40). Blade-flake endscrapers represent a usual typological row (Fig. 17, 42-50).

The geometric microliths include trapezes (Fig. 17, 13-32) and crescents. These last are divided into crescents with sloping retouch (4) (Fig. 17, 6) and with flat retouch (5) (Fig. 17, 11, 12).

As far as we can see, the most important innovation of level 1 industry connected with occurrence of new type of a point (3) (Fig. 17, 37, 38). It is a triangular point with concave base, which was formed by pressure technique. These implements were spread along wide territories from Danube to Caucasus in the Late Copper-Early Bronze age context (BRATCHENKO, 1989). In accordance with chronological data, the distribution of these points coincides with dissemination of Pit-graves and Catacombes population along the Crimea. As well as the importance chronological mark is connected with first occurrence in this level of pottery with "pearls" decoration.

Thus the stratigraphical sequence of Fat'ma-Koba "ground" completely reflect the Late Neolithic evolution in the Crimea.

III. The cultural division and periodisation of the Crimean Neolithic

Until recently, the Neolithic of the Crimea was considered as a homogenous cultural phenomena in the frames of wide cultural area, which once spread along Crimea, Caucasus and left bank of Dnieper (FORMOZOV, 1962, s.123). The Kaya-Arasi cultural group was adopted in the kind of standard for this territory. In accordance with point of view by D.Ya.Telegin, this group was formed under impact of Surskaya culture (TELEGIN, 1971, s.7). The nuclear area of this last occupied the Dnieper valley. Nevertheless, the range of analogies of separate categories of materials don't coincide. So, comparisons of pottery show obvious connections of Crimea with Caucasus and Middle Dnieper. Consequently, the Crimean Neolithic development couldn't be recorded under conditions of impact from one cultural group only.

A different view was presented by Yu.G.Kolosov, who argued two cultural groups divisions in the Neolithic of the Crimea: mountain and steppe (KOLOSOV, 1985, s.156). As a matter of fact, steppe group enclosed sites of Sivash and Kertch areas only. The spatial and chronological features of this phenomena was summarized in so called "Kukrek cultural tradition". Lately this group of sites was evaluated under chronological estimation as "Neolithic stage of Kukrek culture" (YANEVICH, 1987, s.9-12). In accordance with this mean, the chronological changes were due to occurrence of geometric microliths with

pressure retouch and "Alekseevskaya Zasuha" trapezes in Kukrek assemblages. Let us draw the attention that average of Kukrek inserts in these assemblages composes ($28 \pm 12\%$) and geometric microliths (44 ± 16) (YANEVICH, 1987, s.11). Another statistical evaluation leads to the following question. What do we have to bear in mind like a base component for steppe group of industry? In the currently stage of investigations two solutions of this problem could be considered.

These assemblages can be seen into affiliation of separate heterogeneous Neolithic cultural phenomena.

In accordance with typological structure steppe sites, majority have similarities with the upper horizon of Priazovskaya culture. Viewed from pictures by V.N.Danilenko, lithic assemblage from Kamennaya Mogila (upper horizon) contains three main type of MK trapezes (Alimovskiy, Grebeniki and "with retouched surface") and Kukrek component as well (DANILENKO, 1986, fig.11, 12). As we know, Kamennaya Mogila culture has obvious features of developed stock breeding. So, the present of cattle bones on some steppe sites (Table.2) must be accepted in the light of these data.

Thus, the Mountain Crimea represents a entirely homogenous cultural phenomena (Murzak-Koba Neolithic culture). The trends of MK culture development must be taken into consideration under two main indicators: technology and pottery.

Technology

As a rule, technological changes are important components of new socio-cultural systems emergence and stabilization. For example, the formation of Kebarian Near East microlithic industry was accompanied by shift in economy, so called "broad spectrum revolution" (FLANNERY, 1969; BAR-YOSEF, BELFER-COHEN, 1989).

The occurrence of punch technique in the core-reduction strategy and pressure technique in the secondary retouching are both the main features of the Crimean Neolithic technology. As a matter of fact the technological development was a gradual adoption of these innovations. Its occurred in the MK Late Mesolithic environment (Shan-Koba, 1.2; Alimovskiy, 1.2, 3; Tash-Air, I.VIII). First of

all, the introduction of punch technique leads to the broadening of Montbani blanks spectrum and knapping technique as well. The new context of microlithic tool kits was due to pressure technique adoption. So, new "Alimovskiy" type of trapezes occurred on IV stage of Murzak-Koba Mesolithic culture (Table.3).

The next stage of Neolithic development is represented by industries with "Alimovskiy" trapezes prevalence. The use of pressure technique in secondary retouching of other flint categories (endscrapers, retouched blades) could also be recorded.

The occurrence of trapezes with flat retouch on the surface and pottery can be characterized as a next stage of technological development (At-Bash; Tash-Air, I.VI). In due course trapezes with flat retouch surface take a leading place in the industry.

The assemblage of Petrovskaya Balka represents a fifth chronological horizon. The blossoming fort of MK culture Neolithic technology must be recorded here. The occurrence of bifacial points can be seen like a cultural innovation of this stage.

The structure of flint assemblages on the last stage kept a main feature of MK technology except triangular points with concave base adoption (Table.3). As a distinction from local microlithic traditions different types of bifacial points connected with influences from the side of other contemporaneous culture environment.

It is quite reasonable to suppose any distinct boundary was absent between Late Mesolithic and Neolithic in the Crimea. Hence, IV-th stage in Murzak-Koba Mesolithic culture development is a first stage of MK Neolithic culture at the same time. So, both periods show a high degree of similarity in the technological notion, what entitle us to register ethnic continuity as well.

The cultural Mesolithic/Neolithic succession is not an object for discussion any more (BIBIKOV, 1940; KRAINOV, 1960; FORMOZOV, 1962; MATSKEVOY, 1977; KOLOSOV, 1985; KOZLOVSKI, 1987). However, assemblages from Petrovskaya Balka and Fat'ma-Koba "ground" both recorded very deep genetic roots of this continuity. So, upper Neolithic assemblages

represent typological features of both types of industry of MK Mesolithic culture and Shan-Koba, I.4 culture.

Even Final Paleolithic component of Shankobian could be recorded here. Thus, progressive development of microlithic technology took place in the Crimean Mountain until end of VI-th - beginning of III-th mil. cal. BC.

Pottery

The pottery remains in the Crimean Neolithic are not numerous. The quantity and typological assortment of pottery increase from early to late sites. For the whole Neolithic in this territory we can estimate three types of sharp-base and three types of shallow-base pottery (Table.3). The first group presents vessels with plants admixture in the clay (undecorated - At-Bash), with drawn lines and quartz admixture (Kaya-Arasi) and, finally, vessels with comb impressors and broken shell in admixture (Petrovskaya Balka, Kurtzi). Second group comprises thin wall undecorated ceramic (Kaya-Arasi type) with drawn lines and notched stamp decoration (Kurtzi type) and pottery with geometrical ornamentation and "pearls" as well (coastal type). A sharp-base pottery characterizes a first period of the MK Neolithic culture. A shallow-base vessels belong to the second period. Both types could be recorded in the assemblages of Petrovskaya Balka and Kaya-Arasi.

In accordance with data analysis the occurrence of pottery in the Crimean Neolithic is connected with borrowing process from different cultural entities of the neighboring regions where agriculture economy and pottery production were represented. Obviously, the pottery in Crimean Neolithic is the component of simple food storage practices, what is usual evidenced as concerning transitional hunter-gatherers society. So, typological analogies confirmed a Dnieper's emergence of Kaya-Arasi type (FORMOZOV, 1962; TELEGIN, 1971). Shallow-base pottery with drawn lines and notched stamp can be seen in affiliation to upper horizon of Kamennaya Mogila. A pottery with pearls decoration has a broad circle of analogies and, presumably, is connected with Chalcolithic cultures of Caucasus region (Svobodnoye).

The presence in Petrovskaya Balka concentrations of clay and special instruments

for admixture preparation supported the idea about local ceramic production. But, it is not contradicted by the evidences that the mechanism of Crimean Neolithic pottery performed by means of cultural exchange. It is obvious, that this conclusion offered and suggestions are made for future applications and modifications approach.

Thus, the technological development of the Crimean Neolithic posed six stages of gradual evolution. More ponderable taxons of periodization could be defined on the economy features foundation.

IV. Some palaeoeconomy problems in the Crimean Neolithic

The regional approach to Neolithization is based on consideration of local biological resources (JARMAN, BAILEY, JARMAN, 1982). In this connection three types of land use can be recorded in search of optimal relationship between society and natural environment: "direct exploitation", "opportunistic exploitation" and "control exploitation" (BAILEY, 1981, p.1-13). First type corresponds to hunter-gatherers economy, second is connected with farming communities and third so called "hunter-gatherers in transition". This last call the variability in economy behavior due to reply on main components of complexity adoption: food storage, sedentism and exchange network (TESTART, 1988; SOFFER, 1989; ZVELEBIL, DOLUKHANOV, 1991). As a matter of fact "the control exploitation" presupposes some major directions of economy behavior: 1. control under herbivores transference, 2. specialization in hunting activity, 3. restriction of land use volume, 4. the taming as a first stage of domestication (BAILEY, 1981). We shall try to submit process of what the economy of Crimean Neolithic may be treated as an example of this model.

Another important theoretical approach is connected with classification of available resources in the frames of hunter-gatherers economy. So, wild resources were subdivided into two groups: "type K" - mammals with slow reproductive cycle and "type R" - plants, fishs, snails and birds (HAYDEN, 1981, p.525). Viewed from Mediterranean Protoneolithic evidences, the Neolithization processes took place where both types might be used (Natufian, Lepensky Vir, Castelnovian, Kukrek, Grebeniki). Let's

test Crimean evidences in this frame of references.

The redistribution of natural sources in the Crimea led to modification of hunter-gatherers subsistence strategy in the beginning of Holocene period (COHEN-in press). The population of MK Mesolithic culture used different landscape areas, except Second Mountain range and steppe. The majority of sites are connected with External Mountain belt where broad subsistence activities could be recorded: hunting on mammals (*boss, saiga, equus, equus asinus, sus scrofa, capreolus, cervus, ursus, lynx, lepus* and *meles*); hunting on fish (*salmo trutta, leuciscus cephalus, lucioperca lucioperca, silurus glanis, rutilus frisii*); hunting on birds (*otis tarda, ardea cineria, swan*) and gathering (*Helix*). So, annual territory of MK mesolithic culture embraced forth landscape ranges where season specialization must be taken into account. So, coast was inhabited during a late summer, autumn and early winter; First mountain belt-in the summer only. Third represents winter-springtime occupation and Kertch peninsula-late springtime-early summer accordingly. The subsistence strategy corresponds to high mobility model, which was described as "point to point" system (see BINFORD, 1982). Consequently, the MK Mesolithic culture has some features of Protoneolithic societies, both technology (see KOZLOWSKI, 1987) and economy. The absence of tendency to sedentism comprises essential exemption.

The wilds ancestors of recent cattle didn't existed in the Crimea (TSALKIN, 1970, s.259-264). Hence, wild ancestors of dog and pig both could be involved in the domestication.

There are different evaluations of domestication in the Crimea. The first point of view examined to Crimea like big center of ancient pig-breeding from which it spread to other regions of Pontic area (STOLYAR, 1959, s.3-18). A different view is presented by A.A.Formozov, who argued agriculture origin in the Crimea under impact of Bug-Dniester culture (1977, s.65). Following to hypotetic idea by V.N.Danilenko, all of agricultural evidences from Pontic are connected with so called "Kukrek eastern impulse" (1969, s.28). Finally, Yu.G.Kolosov declared a local pig domestication (1985). Despite existence of different evaluations the attention focuses on developed character of Crimean stock-breeding economy. It's because of neither ideas couldn't

lie supported on the currently stage of investigations.

The dog domestication is represented in the Crimea during the Late Paleolithic (Siuren I, up. I.). On the whole, this process was finished in Shankobian Final Paleolithic (Shan-Koba, Siuren II, Fat'ma-Koba) (KRAINOV, 1960, s.128). Early dog species were similar to husky dog; upper - to Pomeranian dog (Murzak-Koba) (BYALINETSKIY-BIRULYA, 1930, s.139-140; GROMOV, 1953). Obviously, dog in hunting practice was a important tool of "control land use principle" realization. The absence of dog among food remains of Neolithic sites is a clear evidence of this development model (Table.2).

In accordance with opinions by paleozoologists early Holocene population of wild boar achieved to blooming stage of development. The rising of population quantity, increasing of fertility and, finally, "big Crimean wild boar" occurrence were recorded here (GROMOVA, GROMOV, 1937, s.72; BIBIKOVA, 1959). So, wild board became a main hunting object in the Third Mountain region. The young wild board specimens are predominant among the archaeological bone remains (till 70%). The Internal Mountain territory doesn't use sites catchment areas. Presumably, inland area served as a natural base for reproduction of wild boar population. In this case we are dealing with prehistoric confirmation of some ethnographic data where hunter-gatherers need no more than 30% of subsistence area for keeping a natural biological background on sufficient level (see BIRDSELL, 1953, p.171-207).

Viewed from paleozoological estimations of Neolithic fauna, the pig (*sus* domestic) was recognized following to young specimens prevalence. In some cases, small pig is recorded, but bone remains quantities were slight (Tash-Air I). Thus, the key subject of stock breeding economy delimiting food-supply on the base of domestic herb exploitation is not recognized in the Neolithic of Crimea. Hence, the relationship between hunter-gatherers and wildboard population during a long time Mesolithic/Neolithic sequence corresponds to "taming", which could be recorded like a first stage of domestication process.

We don't yet have data enough about plant use in diet of Mesolithic/Neolithic population in the Crimea. Nevertheless, the

analyses of dental system of both skeletons from Murzak-Koba burial leads to the conclusion about high quota of plant-food (ZIROV, 1940, s.180). But, this old data waiting for is check.

In accordance with evolution of "broad spectrum economy" features, Neolithic of the Crimea can be subdivided into two periods. The predominance of rock shelter sites with simple structure characterizes a first period. The settlement pattern is connected with some landscapes regions exploitation. The extensive development of prior model is continue for the reason of land use in steppe area. This activity envisages a hunting specialization in each of landscape area (Table.2).

The situation is changed with the second period. It represents open air sites with some food storage structures (Petrovskaya Balka, Shan-Koba, 1.1a) and long-term occupation dwelling (Petrovskaya Balka). The next important innovation connected with distribution of shell midden sites along the coast (Laspi group), where in the first of time, the seal resources exploitation could be recorded (fish, molluscs and crawfish). So, tendency to broadening of economy resources base and sedentism as well must be taken into consideration. During both periods the wild resource exploitation is the economical background. The changes of second period were due to transition from extensive way land use to intensive one.

In accordance with some radiocarbon dates, the chronological frames of Neolithization in the Crimea define a long term continuum (VII - beg. VI - end of IV cal. mil. BC). The late assemblages survive until middle of III-th mil. BC relying on radiocarbon data from Gurzufskaya site (2635 ± 90 unc.BC). In that time the population of Kemi-oba Chalcolithic culture spread from the Caucasus to the Crimea. This culture presents a developed farming economy, metallic specimens and impressive burial practices (SCHEPINSKI, 1985a).

It is quite reasonable to suppose that disappearance of the Crimean Neolithic was connected with Kemi-oba expansion.

MK Neolithic culture was formed on the base of so called "active Neolithization model" (see expl. - ROUSSOT-LARROQUE, 1980) as a majority of South eastern Neolithic

cultures. However, the subsistence doesn't connected with farming economy as distinguished from Bug-Dniester, Kamennaya Mogila and Surskaya cultures. This phenomena can be appreciated in the frames of social estimations.

As we have seen above, pottery and flint assemblages both witness a cultural contact between Crimean Neolithic and neighboring communities. The cultural remains from first period reflected contacts with Neolithic populations from steppe areas, second period connected with Kamennaya Mogila, Pit graves and Catacombs (?) influences. Hence, we can register the social space of network exchange.

The theoretical explanations of social areas between hunter-gatherers and farming firmly embedded in archaeological practice (ZVELEBIL, ROWLEY-CONWY, 1984). These areas are subdivided into three phases: availability phase, substitution phase and consolidation phase (ZVELEBIL, DOLUKHANOV, 1991, p.238). There are different types of culture transformation depending on continuation of these phases. So, Iron Gate region and Pontic area both yielded different examples of culture transformation processes (see SREJOVIC, 1990; CHAPMAN, 1994; KOZLOWSKI, 1989). The Murzak-Koba Neolithic culture is located on outlying area of this social space. The low level of acculturation must be recorded here in the condition of long term availability phase. New culture environment with stock - breeding economy is recorded in the end of Murzak-Koba culture sequence.

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