Population and Social Structure of Tasmola Culture

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ABSTRACT In the middle of the 1st millennium BC, the early Sakas settled by the steppes of Ural-Kazakhstan in the historical community of the *Tasmola culture*. Under its development maximum, it covered considerable territories from east slopes of South Ural in the West to Chingiztau Mountains in the East, from forest-steppe strip of Zauralie and Western Siberia in the North to Lake Balkhash and Betpakdala Desert in the South. The core of this community – the Central Kazakhstan's Tasmola archaeological culture - received scientific justification in the fundamental work of Kadyrbayev in 1966. Except for some generalized works, the grand question which didn't receive proper interpretation about the *Tasmola* tribes is the socio-demographic characteristics of the Tasmola society.

INTRODUCTION

In compliance with the concept of geographical determinism, it is pertinent to present the landscape and climatic features of the territory of habitation by the *Tasmola* tribes. All areas occupied by Tasmolians are divided into three large regions in compliance to both geographical realities and local features of their culture – the Southern Zauralie, the Northern Kazakhstan and the Central Kazakhstan.

In the Southern Zauralie, *the Bobrov-Tasmola* militarized clans during the early period of their history lived in the meridional section from Chelyabinsk to upper courses of the Tobol River. This territory occupies the East slope of the South Ural, parts of the Trans-Ural Plain and the Western Siberian Lowland adjoining to it. The surface of this territory abounds with lakes, hollows and river valleys. The climate is continental with cold, long winter and warm summer. Average temperatures range from -16 °C to -18 °C in January and +17 °C to +20 °C in July. Level of rainfall is about 300 mm (Andreyeva and Markova 2002; Matveyev 2002).

The following two regions, Northern and Central Kazakhstan, belong to one large geographical province – Saryarka, extending 1200km from West to East and located between plains of Turgay in the West and the Irtysh in the East. The climate of Saryarka is dry and extremely continental. Winter is cold with an average temperature of -14 °C to - 40 °C in January. While summer is dry and heated with an average temperature of 20 °C to 35 °C in July. Average annual amount of precipitation is 200–300 mm (Vilesov et al. 2009).

Tribes of Ulybay-Tasmola culture occupied the Northern Kazakhstan, including all territories of the Kokshetau Upland, as well as upstream and middle reach of the Ishim River and its inflows. Average absolute height of the region is 250-450 m having a lot of lakes (Vilesov et al. 2009).

Actually, *Tasmola* tribes settled in the territory of the Central Kazakhstan. Its borders are as follows – from the Tengiz Cavity with absolute heights from 300 to 500 m to the Ulytau Highland with heights from 500 to 1134 m and the Balkhash-Irtysh watershed with heights reaching 1.5 km. There are numerous lakes. The largest rivers are Sarysu, Selety, Shiderti, Tokyrau (Vilesov et al. 2009).

These landscapes and climatic features had an impact on the economic and cultural type of the *Tasmola* tribes – nomadic cattle breeding. Within its realization, different *Tasmola* collectives carried out two main types. The first represented long meridional movement from summer pastures in zone of steppes and forest-steppes to winter pastures on borders of Central Asia and back, that was considered in details by Tairov (2007). The second type was characterized by the year-round nomadism of households, small in number, with an area of 50 to 80 sq.km (Khabdulina 2001). It is possible that the choice of this or that type depended on welfare of the particular Tasmola clan or family line. More well-fixed cattle-farmers could carry out long move-

ments, while less well-fixed ones were limited to the nomadism along a short cyclic route (Gutsalov 2011).

In the *Tasmola culture,* an environment dominated by nomads of the second type, speaking of these research settlement monuments (thirty settlements). These type of monuments alongside topography of burial grounds allow for comparison between the nomads of pasturable and nomadic systems of the Early-Sakas and of future nomads in the region – Bashkirs in the Southern Zauralie, Kazakhs in Saryarka (Beisenov 2014; Savelyev 2007; Khabdulina 2001). Based on this, summer locations of the early nomads were arranged along river banks or near other reservoirs where they gathered with big collectives from related families. During winter, the collectives broke up to family units in the form of small settlements (about 2-5 houses), and are fixed by archeologists (Beisenov 2014; Khabdulina 2001). It allow researchers' proffer solution to questions about demography and social stratification of the *Tasmola* tribes.

During research or study of any historical community, ethnographic group or state association, there are often questions about the number of its population and social order.

The historical researchers have made quite successful attempts in studying questions pertaining to historical demography and social order of *"contemporaries"* and *"neighbors"* of *tasmolas* in the Euroasian continent. The most valid results have on the Scythians, Sarmatians, Xiongnu, nomads Semirech'e Sayano-Altai, Tuva. Researchers studied the political and social structure of the nomads, the demographics based on extensive archaeological material (Akishev 2013; Vasyutin 1999; Gavrilyuk 1994; Grach 1980; Zhelezchikov 1987; Kiryushin andTishkin 1997; Kradin 2001; Kocheyev 1989; Marsadolov 1997; Martynov 1980; Matveyeva 1999; Mironov 1998; Sorokin 1978; Skripkin 2012; Surazakov 1990; Tishkin and Dashkovsky 2003; Khaldeyev 1987; Honeychurch 2015). The authors consider that the methodology used by previous researchers apply for Tasmola culture. Because the nomads of Central Kazakhstan were part of the Eurasian nomads.

METHODOLOGY

The first question, which the researchers will consider, is determination of number of the *Tas-mola* tribes. In historical literature, the question of nomadic population during the early period is considered in a varying degree, and it uses generally a method of *"ratio"* in which researchers proceed from a ratio of number of soldiers or families and total number of inhabitants of various nomadic domains. We will note that in some cases, different researchers often apply different proportions (coefficients) (Gumilev 1999; Kradin 2001; Safargaliyev 1960; Sdykov 2004; Skripkin 2012; Sultanov 1982; Tomilov 1993; Trepavlov 2000).

In this regard, it is necessary to use other methods for determination of possible number of ancient nomads- cattle farmers.

The method of calculation of nomads which is based on the analysis of the available data in conjunction with necessary balance between sources of existence and number of people in the developed territory, that is, an ecological optimum, which began to gain relevance in the last two decades.

Scientists-theorists of nomadism, experts in pre-industrial not settled societies make note enough definitely and almost unanimously the essential influence of conditions of the surrounding natural geographical environment, climate on origin, existence and development of nomadic communities (Alekseyev 1984; Andrianov 1985; Gumilev 1972; Massanov 1995; Kradin 2007; Novozhilova 2013).

Developing the thesis about conditionality of influence of natural factors on formation and development of nomadic cattle breeding and more widely –nomadism, experts note the existence of *"a limit of natural resources of habitat"* that compels nomads to adhere to a certain ecological equilibrium or balance in the territory developed by them (Massanov 1995; Kradin 2001; Novozhilova 2013).

In this regard, researchers believe that if, for example, there is an excessive pasturing, then it translates to disturbance of the equilibrium existing in the ecological system of various region (territory). In this case, if there is no movement due to forage shortage, then, there is a decrease in the general number of cattle and thereafter decrease in number of people in this territory. Gradually the ratio between efficiency of a pasture, quantity of cattle and number of the nomadic population come to balance (Kradin 2001).

Existence of *"a limit of resources"* and compelled maintenance of *"balance"* is caused by very nomadic mode of life and husbandry which is ex-

pressed in *"a disperse condition of the nomadic population"* (Massanov 1995; Novozhilova 2013).

The same *"balance"* in the conditions of nomadic, economic and cultural type in turn cause certain amount of communication between the volume and quality of natural resources in certain territory or its ecological capacity and number of people in the same territory (Alekseyev 1984; Gumilev 1972; Komarova 1991; Kradin 2001; Massanov 1995; Novozhilova 2013).

It would be worthy of note that it is not all about the ratio of ecological conditions in a certain territory and possible number of inhabitants on it, there is another necessary variable, that is, the economic and cultural type which is a way of adaptation to the surrounding environment. In the same climatic conditions, for example, the number of nomadic cattle breeding and settled agricultural population would be different (Komarova 1991).

Investigating dependence of migration of Eurasia nomads on climate fluctuations, Gumilev writes concerning the number of nomads directly – *"population of nomads was defined by quantity of food, i.e. cattle that was in turn limited by the area of pastures"* and everything that connected with *"inclusion of nomads in geobiocenoses of arid zone"* (1972).

Thus other *"ecological ways"* based on calculation of ecological parameters connected with pasture productivity, need of cattle for food, etc. gain the increasing recognition and practical application in researches. In historiography, there is an opinion, though not shared by all, that the data on the number of the nomadic population received as a result of similar researches are the most reasonable. Kradin believes that estimations on population of nomadic societies based on determination of productivity of pasturable resources, calculation based on this probable herd of cattle and number of cattle-farmers are more reliable. As this researcher explains *"the similar technique is based on modeling of energetic processes in ecosystems, determination of probable number of wild and domestic animals, as well as people on the basis of primary bioproduction of arid pastures"* (2001).

Today, there are ways of calculating the nomadic population taking into account an ecological factor.

One of the first who offered a certain way and carried out calculations on its basis was Zhelezchikov (1984).

Zhelezchikov didn't present his calculation in a mathematical formula, instead, it was made by Khaldeyevin in his critical review (1987). In general, mathematical calculations of Zhelezchikov are as follows:

$$H = \frac{T \times \Pi^0/100 \times K/100}{\Pi^1}.$$

H– number of nomadic population.
T – total area, occupied by nomads, km^2.
Π^0 – area of pastures, km^2. Π^1 – area of pasture necessary for maintenance of life activity of one person, km^2.
K – grass eatability coefficient.

Another formula is joint development of Povalyayev (1992). For calculating the number of nomads in a certain territory, they proved the application of the following formula:

$$H = \frac{S \times Y \times K \times F}{M \times B \times 100\%}$$

Where, Í – number of nomadic population.
S – area of pastures, ha.
Y – productivity of herbage, kg per 1 ha.
Ê – grass eatability coefficient.
F – number of people in nomadic family.
M – mass eaten by one conditional head of cattle in a year.
B – number of heads of cattle falling on one family.

A method of determination of the number of nomads jointly developed by Tortika, Mikheyev and Kortiyev get the greatest application among a number of researchers (1994). Mathematically it looks as follows:

$$H = \frac{K_C \times Y \times \Pi_{zim}}{K \times Д}$$

H – number of nomadic population.
K_C – correcting factor for social stratification
Y – productivity of herbage, kg per 1 ha.
$\Pi_{зим}$ – area of winter pastures, ha.
K –daily need for food of one animal, kg.
Д – duration of use of winter pastures, days

During determination of number of the nomadic population making the *Tasmola historical and ethnographic community* in research, we will apply all three formulas that will provide verification of the received results.

For calculations concerning the productivity of herbage, daily need for food of one animal and so on, we will proceed from the values proven by modern researchers in the theory of nomadism.

The experts applying these formulas and their authors recognize in general that possibilities of calculation of population in ecological parameters have restrictions and that they represent *"not valid number"*, but only *"potential of population density for this type of economy"* (Povalyayev 1992; Trepavlov 2000). That is, the figures used in this research reflects possible, probable, but not the actual number of population for a certain moment.

Demographic characteristics and social structure are closely related. In this work, the researchers used the methodological developments tested by researchers at the archaeological material.

Methods are divided into three main areas: general theoretical, formal logic and specific, typological (Ivanova 2001).

One of the main reasons for carrying out reconstruction is burial monuments which indicate volume of the labor costs invested in various burials, also historical and cultural semiotic. interpretation of burial inventory which in total testify to the level of the public relations and social stratification (Alekshin 1975; Lebedev 1973; Masson 1976). That is to say, information on society is included in structure of the burial monument, and its elements are socio-informative in different degrees. As a result, it is necessary to understand the role of ideology of ancient society, semantics and aesthetics of the burial ceremony itself; this introduces certain amendments in research process (Ivanova 2001; Olkhovsky 1995).

In addressing the problem, it is important to determine the terminology. Social stratifications understood by the researchers, after Sorokin, can be viewed as differentiation of some collectivity of people in classes based on their hierarchical order. Its cornerstone is uneven distribution of the rights and privileges, liabilities and responsibilities, existence or lack of social values, power and influence among members of a certain community. Types of social stratification vary and are numerous. However, they are reduced to three main forms: economic, political and professional. All of them are closely bound, and the people belonging to one layer in some relation usually belong to the same layer in other parameters and vice versa (Povalyayev 1992).

OBSERVATIONS AND DISCUSSION

For calculating number of nomads using the formula of Zhelezchikov, the researchers will proceed from the following:

$T=1100000$ km^2–rounded value (calculated on the basis of the existing archaeological data on the territory occupied by *Tasmolians*).

Π^0 =65% – average value is taken, the area of pastures makes usually 60-70 percent of the total area occupied by nomads.

Π^1=1.85 km^2 –area of pasture necessary for maintenance of life activity of one person.

K=60 percent.

As a result the researchers obtain:

$$\frac{110\ 00\ 00\ X\ 65/100X60/100}{1.85} = 231\ 892 \text{ persons.}$$

For formula of Evdokimov and Povalyayev the researchers use the following parameters:

S=71500000 ha – for the previous formula it is noted that the area of pastures makes about 65 per cent of the total area occupied by nomads, then the received result was transferred from km to ha (1100000×0.65×100).

Y=700 kg.

K=60%=0.6

F=5 – average value is taken, in historical literature the number of the nomadic nuclear family (parents and single children) makes usually 4-6 people.

M=7719,75 kg – on average the daily mass eaten by one head of cattle per day makes 21,15 kg (21,15×365).

B=30 – number of the heads of cattle falling on one family.

$$\frac{71500000x700x0.6x5}{7719.75x30x100\%} =$$

We obtain:

$$\frac{71500000x700x0.6x5}{7719.75x30x100\%} = 648\ 337 \text{ persons.}$$

In the formula of Tortika, Mikheyev and Kortiyev the researchers use the following data:

K_c=0.0202

Y=700 kg.

Π_{zim}=28 600 000 – for the previous formulas it is noted that the area of pastures makes about 65 percent of the total area occupied by nomads, the area of winter pastures in turn makes 30-50 percent of all area of pastures, then the received result was transferred from km to ha (1100000× 0.65×0.4×100).

K=3.5 kg – daily need for food of one animal, kg.

Д =150 days – duration of use of winter pastures.

In general, the researchers obtain according to this formula =770 293 persons.

$$\frac{0.0202 \text{x} 700 \text{x} 28\ 600\ 000}{3.5 \text{x} 150} = 770\ 293 \text{ persons.}$$

The second question is reconstruction of social picture of the *Tasmola society*. According to the remark of the researcher Khabdulina, a subject world of *"tasmola"* tribes allows to assume the existence of three main *stratas* in *Tasmola society* – soldiers-combatants, ministers of religion, ordinary member of community. The first have burials with full military equipment (armament supplies, type-setting belts, items of horse bridle). The second - stone altars, bronze mirrors, sets for a tattoo (*"cases"* with powdery paint, bone hairpins). Representatives of the third layer in the burials were arrowheads, slip stones, knives (2007).

In total, the researchers have analyzed 76 burials from 24 burial grounds in the Central Kazakhstan, 39 burials from 22 burial grounds in Northern Kazakhstan and 7 burials from 7 monuments in the Southern Zauralie.

Atop of the *Tasmola society* there were large leaders - representatives of aristocratic clans and regional elite accumulating in themselves the functions of both the Supreme governors, and priests. Funerary monuments of the strata studied in the territory of Karkarala district, Karaganda region in large mounds type *Taldy-2* with a rich inventory and multiple symbolic insignia of power. The image of a tiger acts as the most widespread (Bilyalova and Yarygin 2013). These are barrows and burial grounds – *Akbeit, Akshoky, Karashoky, Nurken-2, Nazar-2, et cetera.* Many of them were plundered; however, the small fragments which fell into hands of archeologists speak about rich accompanying inventory in similar burials before the plunder (Beisenov 2011).

The soldiers-aristocrats heading troops and similar military associations are second. An example of the carrier of this status can be buried in barrow No. 5 of the burial ground *Kichigino I* (Southern Zauralie). Numerous insignia of the power in the form of different images of tiger on an earring, plaque decorating the top part of the breast, belt plates, and plates for goryts according to researchers, is one of the richest burials of the *Tasmola culture* in the Southern Zauralie. The barrow sizes, burial design complexity and analysis of inventory allowed to claim that buried person *"belonged to a military and aristocratic top of nomadic society of Southern Zauralie"* (Tairov and Botalov 2010).

The patrimonial elders or insignificant leaders having vassal, kinship and other communications with the Supreme elite are comparable on a social rank. Among these can be burials in barrows *No. 2-4, 6* of a burial ground *Tasmola V*. The available inventory is presented by jewelry, horse harness, stone altars, accompanying burials of horses. Some of them are plundered; however, available analysis material shows higher status in comparison with other monuments. In mounds, 3-4 and 6 are golden figures of tigers (Kadyrbaev 1966).

The next group of soldiers' stratum-combatants based on archaeological data is possible to separate two groups in its structure.

The first so-called *"frame"* of stratum in the Central Kazakhstan contains burials in barrow *No. 1* of burial ground *Tasmola II*, in barrow *No. 1* of burial ground *Nurmanbet IV*, burial *No. 1* in barrow *No. 27* of burial ground *Tegiszhol*. In the Southern Zauralie – burial *No. 2* in barrow *No. 1* of burial ground *Nikolayevka II*, burial *No. 3* in barrow *No. 2* of burial ground *Irtyash 14* and barrow *4* of burial ground *Bobrovsky*. For Northern Kazakhstan, it is possible to note burials in barrows *No. 1-2* of burial ground *Alypkash* (Tairov 2007; Kadyrbayev 1966; Khabdulina1994; Varfolomeyev 2011).

The second group is presented by burials which are already less filled by military inventory, and the burials are generally presented by only considerable quiver sets – burials in barrow *5g* of burial ground *Karamurun I*, in barrow *13* of burial ground *Alypkash* (Tairov 2007: 343; Kadyrbayev 1966; Khabdulina1994).

The question designated by Khabdulina stratum of priests causes certain difficulties. At the moment, archaeological material shows that not only representatives of ruling stratas could discharge their functions. In the Scythian society, priests perform *"anareys"*, which have transgender characteristics. The researchers know at least one *Tasmola* monument that has these attributes in the burial mound *No. 1* of burial ground; *Bozshakol-5*. A skeleton of young man (18-25 years) accompanied by a bronze mirror and stone altar was found as a result of excavation (Amirov et al. 2010).

The last stratum was ordinary shepherds - members of community which monuments represent the majority in this selection. They are widely presented in the North Kazakhstan Priishimye and basin of the Shiderty River (Kadyrbayev 1966; Khabdulina1994).

Thus, the researchers obtained some results on the number of *nomads-tasmolians*: 231 892, 648 337 and 770 293 people. The probable number of the nomadic cattle breeding population

making the *Tasmola community* could fluctuate in considerable limits from more than 200 000 to more than 750 000 people.

The researchers take the smallest obtained result (about 200 000) as a probable minimum of population. For receiving final results they have to proceed from the premise that calculations of number of the nomadic population by ecological parameters have restrictions because represent as a result not the real number of nomads during different historical periods, but probable, that the maximum potential of population in a certain territory with defined set of ecological characteristics. The real number has to be changed for the smaller. Moreover, the "lowering" factor having an impact on the number is a natural environment in which there were ancient nomads, more exactly - direct dependence on it. Sharp decrease or increase of temperature, snow storm, ice-slick, epizooty, etc. affected the number of animals negatively for a short period and as a result led to reduction in number of people.

Authors agree with Habdulina (2007) and Honeychurch (2015) about a differentiated structure of nomadic society. However, the researchers are adding in the Tasmola culture 2 social strata. The authors have done this by analyzing the new archaeological materials.

CONCLUSION

Based on these provisions and data obtained by scientific calculations and use of the ecological parameters, the researchers draw a conclusion, that the total constant number of the nomadic cattle breeding population making the *Tasmola historical and ethnographic community* could fluctuate ranging from 200 000 to 450 000 people. The social structure of the society is a complex dynamic system of social strata with internal subgroups – the military and priestly *aristocracy – leaders*, *patrimonial elders*, *military aristocracy*, *soldiers-combatants* (two groups) *and ordinary shepherds*. At this stage, they can speak with confidence about existence of separate chiefdoms in the territory of moving of *tasmolians*, this be confirmed by dividing into districts and mapping of large barrows of elite. They are rather evenly distributed in the Saryarka along waterways.

RECOMMENDATIONS

Previous researchers identified border of the Tasmola culture, chronological frameworks and characteristic features. In this paper, the researcher used a comprehensive approach, which includes archaeological and ethnographic data. In the future, researchers need to pay attention to the anthropological structure of large funerary complexes, cemeteries. Because anthropological data make it possible to determine the main parameters of the socio-demographic characteristics.

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