Anthropoeceological Investigations in Central Asia

Tatyana I. Alexeeva

Institute and Museum of Anthropology, Moscow State University, Moscow, Russia

Abstract The results of anthropoeceological investigations in Central Asia are described. From 1976 to 1991 about 6,000 individuals of both sexes were examined. 2,500 of them were children from 7 to 17 years. The program included the study of body build, metabolic rates, genetic markers and demographic structures. Different groups of Tuvins, Khakass, Mountain and Abakan Shortys, Altai-kijis, Telengits, Teleuts, Kazakhs, and several groups of Mongols and Khotons were studied. It was shown that some patterns of body build and physiological traits of native populations of Central Asia partly reflect the influence of the geographical environment. The differences observed between various populations of the region may be explained by ecological reasons and not only by ethnic differentiation. J Physiol Anthropol Appl Human Sci 24(4):285-287, 2005 http://www.jstage.jst.go.jp/browse/jpa [DOI: 10.2114/jpa.24.285]

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Anthropoeceological investigations in Central Asia started in 1976. They embraced the territories of the Altai-Sayany mountains and Mongolia. Later studies were conducted from 1986 till 1991.

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Territorially, Central Asia was a good choice for anthropological investigations because original populations have much in common racially and genetically. Thus, a natural experiment in Central Asia which had been prepared by history and nature had the potential to become a very successful chance for us as we had a rare opportunity to study representatives of genetically close anthropological types in various ecosystems.

Identity of economic and cultural types and the resulting resemblance of diet and nutrition facilitated the investigative task. They made it possible to identify laws of climatic and geomorphological influences on the human organism as well as a number of other biological parameters of human populations.

In the Altai-Sayany Plateau the following groups were studied:

In the mountain-taiga area: Tuvins (Mongunsky-Taiginsky region; 1830 m above sea level); Tuvins-Todjins (Todjinsky region; 1010 m above sea level); Altai-Kiji (Ust-Kansky region; 1100 m); Mountain Shortsy (Tashtagolsky region; 450 m); and Abakan Shortsy (Tashtypsky region; 580 m).

In the mountain-steppe area, Telengits and Kazakhs (Kosh-Agachsky region; 1750 m) were studied; in the steppe and desert-steppe area: Tuvins (Dzun-Chemchiksky region; 732 m) and Teleuts (Belovsky Village Centre of the Kemerovskaya region; 265 m); and Tuvins (Erzinsky region; 1035 m). In the forest-steppe area: Khakass-Kachints (Shirinsky region; 470 m); Khakass-Sagaitys (Askizsky region; 400 m); and Khakass-Kyzyls (Shirinsky region; 450 m).

In Mongolia, in the mountain-taiga zone, Khalkha-Mongols of the somons Bag-Ulziy (1500 m), Burd (1550 m) and Zhargalang (1500 m) were studied; in the desert zone—Khalkha-Mongols of the somons Bayan-Lig and Bogd (1113 m). In the steppe zone, Khalkha-Mongols of the somon Khalkhgor (590 m); and Khalkha-Mongols, Derbets and Khotons of the somon Tarialan (1380 m) were also studied.

Our studies of Altai-Sayany mountain populations discovered that the nature of morpho-physiological parameters of populations living in severe continental climatic conditions had many specific features. To begin with, they reflect several adaptations to cold stress influence (Alexeeva, 1984; Alexeeva et al., 1998; Klevtsova, 1987).

First of all, I must mention the brachimorphic type which is characterized by relatively shortened lower limbs, relatively heavy weight, a large amount of fat, and a rather high level of cholesterol in the blood serum. This combination of morphological and functional parameters is characterized as a reaction to cold-stress and is called the continental adaptive type (Alexeeva, 1977).

Application of canonical analysis for evaluation of morphological traits of Central Asian populations revealed that the most taxonomically valuable features are as follows: stature, leg length, transversal and sagittal chest diameters,
pelvic breadth, ankle breadth, body weight and average skinfold.

Canonical analysis showed the existence of the two clearly expressed morphological types in the studied area: the first one, of massive body build with large body weight, a big chest circumference, with a wide pelvis and well developed skeleton, and increased fatness; the second one, more gracile, with much less body length, a flatter chest, a less developed skeleton, and decreased fatness.

The majority of Central Asian populations studied relate to the first type. They are concentrated in the steppe zone, while the gracile type is more common in the taiga regions (Chikisheva, 1986). The most typical representatives among the latter are Tuvins-Todgins and Mountain Shortys.

For the time being it seems difficult to explain such morphological differentiation.

The territory of Central Asia is characterized by a single subsistence type—nomadic and seminomadic pastoralism of an arid zone. The only exception is Mountain Shortsy, who were until recently hunters, fishermen and gatherers (Andrianov and Cheboksarov, 1972). The diet of Central Asian peoples is rich in protein and fatty food which results in high caloric value. Hence, nutrition can hardly explain the differences in body build among the native populations of Central Asia.

Somatic differentiation cannot be explained either by different genetic origin. In spite of slight anthropological differences (the peoples of Altai are more European, while the peoples of Sakha and Mongolia are more Mongolid) their morphological base is rather similar (Alexeev and Gokhman, 1984). Thus, the suggestion that massive and gracile types may be of different origin should be rejected.

It seems that the nature of those differences is purely ecological, though one cannot find direct evidence of this. In the anthropological literature there are some data about the connection between gracile forms and some deficit of bone formatting mineral elements in acid forest soils (Alexeeva, 1979; Dobrovolskaya, 1984). It may be that in our case we are dealing with the same situation.

Ecological differentiation of Altai-Sayany peoples and Mongolia is not limited by dividing them into steppe and taiga versions. In the framework of the expressed continental type, some traits of high altitude adaptation can be traced, expressed morphologically in an enlarged medullar canal and chest dimensions. It is especially expressed in the populations of Khangai living at altitudes of 2000 m above sea level.

The morphophysiological status of the Gobi populations compared with the Kangai populations is characterized by clearer manifestation of the continental adaptive type. The Gobi populations are more brachimorphic, with greater developed skinfolds.

Adaptive types of taiga and steppe were discovered too. But the most characteristic feature of Mongolian populations is adaptation towards high altitudes.

The demographic structure of Central Asian populations is greatly variable, though they have many common features. In general, Central Asian populations are characterized by low tempos of age dynamics. One can observe prolonged skeletal maturation and biological age kept behind chronological age. These features are peculiar for longevity populations.

The low life span typical of some Central Asian groups is connected with unfavourable social factors.

Analysis of growth curves and growth rates in children living in different geographical regions of Central Asia show that the longest period of growth is typical for desert inhabitants, the most intensive, for those of the steppe zone.

Morphological characteristics typical for inhabitants of different ecological niches of Central Asia have already been observed in children.

Conclusions

Summing up, we can propose that some patterns of body build and physiological traits of native populations of Central Asia partly reflect the influence of geographical environment. The differences observed between the various populations of the region may be explained by ecological reasons and not ethnic differentiation alone.

The leading factors creating the morphological and physiological patterns of the populations are low temperature, altitude, rainfall per year, and level of landscape aridization.

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Correspondence to: Professor T. I. Alexeeva, Institute and Museum of Anthropology, Moscow State University, Mokhovaya str., 11, Moscow 125009, Russia
Phone: +7-095-203-6609
Fax: +7-095-203-3554