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PREHISTORIC AND RECENT POPULATIONS OF CHUKOTKA: A PALEOPHENETIC ANALYSIS

Thirty nonmetric traits were studied in two cranial series from prehistoric coastal cemeteries on the Chukchi Peninsula (hereafter Chukotka) – Welen (58 crania) and Ekven (107 crania), representing the Old Bering Sea culture. Both series are close not only to modern Eskimos, Chukchi, and Aleuts but also to Tungus-speaking groups. This may be due both to ancient contacts between continental and coastal populations and to their common origin. Comparisons with the Neolithic groups of Baikal and with southern Mongoloids suggest that Eskoaleuts originated in Siberia, and that admixture between migrants from continental Siberia and those from more southern areas of the Pacific coast was one of the key factors in this process. Another factor was adaptation to the extreme Arctic environment.

Keywords: *Craniology, population history, nonmetric cranial traits, Chukchi Peninsula, Eskimos, Aleuts, Chukchi.*

Introduction

The purpose of this study is to assess the position of cranial series from two pre-Metal Age cemeteries on the Beringian coast of Chukotka – Welen and Ekven – among other series from Northern Asia, using nonmetric traits. These two groups, representing the Old Bering Sea culture, were first studied by M.G. Levin (1962), who, based on craniometric data, described them as quite Eskimo-like, concluding that the Eskimo trait combination was very ancient. G.F. Debetz (1975) reached the same conclusion in his study of Eskimo origins. The dental analysis revealed that both groups were similar to each other and to recent Eskimos, Chukchi, and Aleuts, and that both groups had retained ancient trait combinations of the dental structure found in certain Mesolithic and Neolithic populations (Zubov, 1969).

Results of craniometric comparisons between ancient and recent groups are often affected by diachronic variation, which distorts population relationships. These relationships can be more reliably reconstructed if the traits are unaffected by temporal trends. This appears to be the case with nonmetric characters of the cranium. In this study, they provide a basis for a comparison of prehistoric samples from Chukotka with modern Mongoloid groups. Nonmetric traits, known as "phenes" in Russian zoological literature, are used as quasi-genetic markers by zoologists in population studies. Principles of population genetics are thereby extended to cases where genetic analysis is difficult or impossible (Timofeyev-Resovsky, Yablokov, 1973; Timofeyev-Resovsky et al., 1973).

Indirect data suggests that nonmetric variations of the cranium result from normal developmental processes and are to some extent controlled by genetic factors

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(Lane, 1977; Cheverud, Buikstra, 1981; Sjøvold, 1984). Also, numerous studies have demonstrated that groups unrelated by origin differ in the frequencies of these traits, whereas the likelihood of related groups being similar is much higher. Therefore the application of genetic methods appears to be very useful in the analysis of population affinities between ancient groups.

Materials and methods

In our earlier publications we have proposed a list of nonmetric cranial traits and a methodology of their analysis (Movsessyan et al., 1975; Movsessyan, 2005). In this study, these traits were scored on 107 crania from Welen and 58 from Ekven. For comparative purposes, their frequencies in previously published prehistoric and recent Mongoloid series were used (Mamonova, Movsessyan, 1998; Movsessyan, 2005). Frequencies were calculated per individual, i.e. without regard to unilateral or bilateral occurrence. Statistical analysis was conducted using three methods: (1) Nei's generalized distance (*d*) (Nei, 1972); (2) classification analysis based on the PHYLIP – Phylogeny Inference Package (Felsenstein, 1989); and (3) canonical variate analysis based on the CANOCLUS package by V.Y. Deryabin.

Table 1. **Frequencies of nonmetric cranial traits in ancient populations of Chukotka and modern Eskimos, Chukchi, and Aleuts**

No.	Traits	Welen	Ekven	Eskimos	Coastal Chukchi	Reindeer Chukchi	Aleuts
1	Sutura frontalis	0.051	0.028	0.049	0.040	0.010	0.054
2	Foramen supraorbitale	0.579	0.443	0.637	0.733	0.777	0.642
3	Foramen frontale	0.129	0.141	0.196	0.160	0.167	0.071
4	Spina trochlearis	0.010	0.019	0.027	0.010	0.010	0.038
5	Foramen infraorbitale accessorium	0.120	0.129	0.151	0.177	0.196	0.250
6	Os zygomaticum bipartitus trace	0.021	0.010	0.029	0.040	0.028	0.167
7	Spina processus frontalis	0.069	0.205	0.315	0.266	0.171	0.163
8	Os Wormii suturae coronalis	0.010	0.018	0.010	0.010	0.010	0.010
9	Stenocrotaphia	0.043	0.108	0.243	0.134	0.152	0.085
10	Os epiptericum	0.108	0.166	0.045	0.067	0.057	0.100
11	Processus frontalis squamae temporalis	0.010	0.090	0.010	0.013	0.014	0.020
12	Os Wormii suturae squamosum	0.021	0.019	0.010	0.010	0.010	0.020
13	Os postsquamosum	0.103	0.151	0.127	0.120	0.180	0.089
14	Os asterion	0.034	0.122	0.029	0.053	0.029	0.054
15	Foramen parietale	0.327	0.383	0.513	0.400	0.416	0.446
16	Os Incae	0.017	0.047	0.010	0.040	0.014	0.019
17	Os triquetrum	0.030	0.038	0.045	0.053	0.014	0.058
18	Os apicis lambae	0.034	0.010	0.010	0.014	0.027	0.038
19	Os Wormii suturae lambdoideae	0.086	0.113	0.063	0.085	0.083	0.192
20	Os Wormii suturae occipito-mastoideum	0.010	0.010	0.049	0.160	0.039	0.073
21	Processus interparietalis	0.086	0.047	0.039	0.069	0.069	0.010
22	Tuberculum praecondylaris	0.050	0.047	0.050	0.046	0.059	0.022
23	Foramen tympanicum	0.175	0.184	0.167	0.236	0.222	0.178
24	Foramen pterygospinosum	0.034	0.037	0.078	0.093	0.062	0.072
25	Foramen pterygo-alare	0	0	0.039	0.046	0.078	0.036
26	Sutura palatina transversa (concave)	0.018	0.019	0.061	0.111	0.061	0.036
27	Torus palatinus	0.185	0.208	0.147	0.155	0.223	0.286
28	Torus mandibularis	0.346	0.220	0.075	0.250	0.050	0.238
29	Sulcus mylohyoideus	0.154	0.110	0.125	0.125	0.142	0.142
30	Foramen mentale accessorium	0.077	0.060	0.050	0.250	0.285	0.200