67. *On the Djalainor Skulls.*

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Introduction

A moderately fossilized skull was once found in the Nanmekou Open Mine, Djalainor coal-field, 36 km southeast of Manchuria, the western end of the Hinshu line, and it was forwarded to our Museum. Of this skull, which is now called the Djalainor skull No. I, I. AKABORI already presented the results of his study in a paper entitled, "A few additional findings from the Djalainor deposit, North Manchuria", in the *Journal of Anthropology*, vol. 54, no. 3, and concluded that, "no special archaic character is observable". Several years ago, I noticed that the Djalainor skull No. I exhibits a rather high state of fossilization, large rectangular orbit, rather broad bizygomatic breadth, and comparatively low degree of Nasion-Prosthion line etc. These characters lead me to believe that this skull may belong to some archaic race.

In the fall of 1943, Yoshiro YUDA of the Manchurian Jukogyo Co., collected another well fossilized skull in the Djalai Coal-mine (now to be called the Djalainor skull No. II), and forwarded it to me for study.

Since then, these two skulls were carefully studied by the biometric method, which resulted in revealing their archaic features. In order to clarify their geological, anthropological and archaeological relationship, some field work was undertaken during September 1st to 30th in 1944. in the vicinity of the Djalai Coal-mine in cooperation with Dr. PEI WEN-CHUNG, who is responsible for the archaeological side.

As a result of our field work, several specimens of fossilized human skeletons, some mammalian fossils and many stone implements were collected. The results of the geological observations in the field and anthropological conclusions so far reached based upon the material collected are presented in this paper. A report of the archaeology will be published by Dr. PEI in a number of the *Museum Bulletin*.

For their great help in both the field and laboratory, I wish to express my sincere thanks to Dr. H. YABE, Emeritus Professor of the Tohoku University, Prof. P. Teilhard de CHARDIN in Peking, Prof. Kozyo KUDO of the Manchurian Medical College in Mukden, and Prof. Y. IMAMURA of the Keijo Imperial University.

Geological Relationship

In order to decide whether or not the Djalainor skulls Nos. I and II were found in the Pleistocene deposit in the Djalainor Coal-field, it needs to find first some fossilized human skeletons in the same horizon from where the two problematic skulls were known to have been unearthed, and second, some stone and bone implements as well as mammalian fossils in their association.

The exact place from where the Djalainor skull No. I was found can no longer be observed, owing to it being completely removed during subsequent works at the Nanmeikou Open Mine. However, in the cliffs just opposite from where the skull No. I was found, the following succession of the rocks is still visible.

Surface soil	10—30 cm
Peat	15—30 cm
Gravel with many unioid shells	15—30 cm
.....unconformity.....	
Greyish fine sand	1—2 m
Yellowish to greyish sand with gravel	2—4 m
Gravel	1 m
.....unconformity.....	
Coal seam	

Skull No. I might have been derived from the base of the horizon of the yellowish to greyish sand with gravel. Since many years, it has been well known that rather well preserved skulls and limbs of *Elephas promigeninus* BLUM. var., *Rhinoceros antiquitatis* BLUM., *Equus przewalskyi* POLIAKOFF, *Bos primigenius* BOJ., *Capreolus manchuricus* LYD., etc. were found in the sand and gravel beds lying between the surface soil and the coal seam in the Djalainor coal-field; these mammals are leading fossils of the Pleistocene.

Djalainor skull No. II was found at the 3rd colliery, which is located 300 m south of the Djalainor station. There the columnar section, as obtained by the boring data of the Djalai Coal Mine Co., is as follows.

Surface soil	1.5 m
Peat	0.1—0.5 m
.....unconformity.....	
Grey to yellowish fine sand with gravel	32 m
.....unconformity.....	
Coal seam	

Skull No. II might have been unearthed in the grey to yellowish fine

grained sand, about 10 m below the surface. However, it was actually found on the about 30 m high heaps of sands extracted from two inclined shafts of the colliery.

As some human skeletal bones, mammalian fossils and stone implements were found on the above mentioned heaps of sands, it is reasonable to infer that all these materials were formerly embedded in the same horizon in association with skull No. II.

Fortunately, the following human bones were found on the above mentioned heaps of sands, namely, left half of a mandible, right ulna, left ulna, and a fragment of a rib. Moreover, from the same heaps the following mammalian fossils were collected, namely *Elephas primigenius* BLUM. var. (fragment of the maxillae), *Rhinoceros antiquitatis* BLUM (a tooth, two metacarpus), and *Equus przewalskii* POLIAKOFF (a tooth and fragments of limb bones).

As to the stone implements, two microlithic blades were found, one of which looks like an arrow head, on the same heaps of sands mentioned above.

On the facts stated above, there remains little doubt that the strata from which the skulls Nos. I and II were found, geologically belong to a later time of the Pleistocene.

Anthropological Relationship

Concerning the morphological characters of the Upper Palaeolithic human series, G. M. MORANT in his work, "Studies of Palaeolithic Man IV, A Biometric Study of the Upper Palaeolithic Skulls of Europe and their Relationship to Earlier and Later Types," p. 157, made the following statement.

"The Palaeolithic group has a peculiarly small variation in palatal breadth, in the arc (S_3) and chord (S'_3) of the occipital bone from lambda to opisthion and in the curvature of that arc (Oc 1). The only character found to have a peculiarly large variation is the orbital breadth".

"The means of the Upper Palaeolithic series fall within the inter-racial ranges for modern races in the case of the vast majority of absolute, indicial and angular measurements compared. Definite exceptions to this rule were only found for the horizontal circumference (U), the sagittal arc from nasion to opisthion (S), the glabella-occipital length (L), the foramina length (fml) and probably for the internal-bi-orbital (IOW) and bi-zygomatic (J) breadths as well—the Upper Palaeolithic means being greater than the largest modern racial one observed—and for the orbital and foramina indices, which both peculiarly low".

In referring to the skull No. I (Figs. 2, 4) for the above cited criteria, its

orbital and foraminal indices are 77.3 and 76.3 respectively, both being remarkably low and short, thus suggesting Upper Palaeolithic features. Moreover, the internal-bi-orbital breadth of the skull is 101 mm and is comparatively large; the auricular height, the basion-bregma height and the nasion-prosthion line are measured respectively at 107 mm, 123 mm, 65 mm; the breadth of foramen magnum is relatively narrow and the breadth of orbit is rather large; all these characters indicate archaic affinity.

Fig. 1. *Norma facialis* of the Djalainor skull No. II ($\times 2/3$)

On the contrary, its maximum length is rather narrow, the maximum breadth relatively large, the arc and chord of the occipital bone are rather short. All these features may not be considered as archaic characters of the Upper Palaeolithic series in Europe. But here we are dealing with material from East

Asia, thus it seems to me, that such special quality can not be regarded as important, because the Djalainor Skull No. I belongs to an ancestral tribe of the brachycephalic races as Mongol.

From the point of view in anthropology, it is quite reasonable to conclude that the skull No. I belongs to a race of the late Upper Palaeolithic series.

Fig. 2. *Norma facialis* of the Djalainor skull No. I (2/3)

It is very interesting to notice the remarkable deformation of the skull No. II (Figs. 1, 3). That is, it had a very remarkable artificial pressure on its forehead during life-time. As its consequence, the forehead is much retreated backwards, and the supra-occipital part projects extraordinarily forwards.

According to F. WEIDENREICH*, such deformation on the forehead is also noticeable in the Skull No. 102 from the Upper Cave of Choukoutien. It is very interesting to find that thus deformed skulls are found in the strata of Choukoutien and Djalainor, both which are not so much different in age.

* F. WEIDENREICH (1939): On the Earliest Representatives of Modern Mankind Recovered on the Soil of East Asia. Peking Natural History Bull., Vol. 13, part 3.

Since the deformation is extraordinarily large on the cranial part of skull No. II, it is not suitable to its anthropological measurements by the biometrical methods, but there is no question that its facial part exhibits some characteristic features of the Upper Palaeolithic man.

Fig. 3. *Norma lateralis* of the Djalainor skull No. II (2/3)

Namely, the skull No. II is very characteristic in its very highly mineralized fossilization, the forwardly projected glabella, very shallow fossa canina, somewhat downwardly narrowing maxillae and the infant form on the base of the nasal aperture.

Moreover, the bizygomatic breadth and the internal bi-orbital breadths are 138 mm and 97 mm respectively. The right orbicular index is 72.1, while the superial facial index is 53.6; these numerical values are rather noticeable archaic features of skull No. 11.

The Djalainor mandible shows the following characteristics.

The index of robustness of the body is 42.9 and it surpasses the mean

values of the modern races by 1.6, and the thickness of the part of foramen mentale is rather heavy in contrast with that of the modern races.

The angle of inclination of the frontal part, approaches the mean value of the Upper Palaeolithic series.

It is also very noticeable for the distinct development of torus marginalis, torus lateralis superior and sulcus intertoralis.

The presence of 3 foramen mentale and rather strong development of the linea intermedia are other remarkable features.

Fig. 4. *Norma basalis* of the Djalainor skull No. I (2/3)

Archaeological Relationship

Many chipped microlithic implements as arrow heads, spear heads, knives, blades, flakes, grattoirs and nuclei of agate, vein quartz and obsidian were found on the terraces of the west side along the small river Moutonaya, which runs between the lake Djalai and Djalainor city. Many similar artifacts were also found in association with the human skeleton and the mammalian fossils

on the heaps of the sands near the 3rd colliery.

According to Dr. PEI WEN CHUNG's opinion, these microlitic implements belong to the Mongolian-Linhsih type and consist only of chipped implements without a single piece of the polished ones. Their age may be assumed as the early part of the Mesolithic.

Around the Nanmeikou Open Mine where the skull No. I was found, some microlitic implements of the Mongolian-Linhsih type were collected, besides one biface-like implement of certain Palaeolithic appearance. It is possible that near the Nanmeikou Open Mine, there are two archaeological horizons, one of which is Mesolithic in age and the other older.

Concerning the archaeological studies in Djalainor, the readers are referred to Dr. PEI WEN CHUNG's work to be published in a forthcoming number of the same Bulletin.

Conclusion

a) One fossilized left half of a mandible, right ulna, left ulna and one fragment of a rib of human skeleton was found on the heaps of sands at the 3rd colliery in the Djalainor coal-field from where the skull No. II was formerly collected. It is possible that the above mentioned human bones were imbedded, in association with skull No. II, in the sandy strata intercalated between the overlying surface soil and the underlying coal seams.

b) One tooth and 2 metacarpals of *Rhinoceros antiquitatis* BLUM, one broken maxillae and some fragments of limbs of *Elephas primigenius* BLUM. var., one tooth of *Equus przewalskyi* POLIAKOFF as well as one tooth of Bovidae was collected on the heaps of sands at the 3rd colliery in Djalainor. From the palaeontological point of view the fossiliferous strata of Djalainor may be correlated with the Kuhsiangtun formation which is late Pleistocene in age.

c) Some chipped microlitic implements which belong to the Mongolian-Linhsih type, were found in association with the human skeletons and the mammalian fossils in the same horizon where the Djalainor Skull Nos. II and Mandible were collected. By these data, it seems that the above cited strata may represent the earliest part of the Mesolithic, in archaeological age.

d) The Skull No. I is very characteristic in having a low degree of the orbital and the foraminal indices, relatively large value of the internal-bi-orbital breadth, comparatively short height of the auricular, the basion-bregma and the nasion-prosthion line.

e) The Skull No. II is very remarkable in having a forwardly projected

glabella, very shallow fossa canina, downwardly somewhat narrowing maxillae, the infantly form on the base of the nasal aperture, relatively wide bizygomatic and internal-bi-orbital breadth as well as low degrees of the orbicular and the superial facial indices.

f) The Djalainor mandible is very noticeable in the relatively high degree of its index of robustness, thickness of the mandibular body, comparatively large angle of inclination of the frontal part, development of the torus marginalis, the torus lateralis superior, the sulcus intertoralis and the linea intermedia. The presence of 3 foramen mentale indicates another archaic, characteristic feature of this specimen.