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LATE NEANDERTHAL FROM KULNA CAVE AND THE SYSTEMS' THEORY

by

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In the 1965 and 1970 during the excavation of the Kůlna Cave in Moravian Karst region (Czechoslovakia) K. Valoch has found two interesting cranial remains of late neanderthal man (JELÍNEK, 1967, 1966, 1981; VALOCH, 1967). The first was a part of right upper jaw with four teeth in situ and the second a large part of the right parietal bone. Both were found in the same undisturbed layer together with archaeological finds of micoquian type and with faunal remains. Stratigraphically the layer belongs to the end of the first cold part of the last glacial period and the absolute dating by C^{14} gives 45 660 ± 2850/2200 years BP. Even when the mentioned human cranial remains are fragmentary, they bring some important informations considering the late age of the layer and the problems of the relationship between the last neanderthals and first modern men in Central Europe. Two other anthropological facts alarm our interests. First the age of the early Upper palaeolithic Mladeč finds from Central Moravia. This is only 45 km far from Kůlna cave and coming from the first temperate climatic oscillation in the last glacial period, it is between 30 - 40 000 years BP old. Second is the age of the mandibular fragment of the neanderthal child found in Šipka Cave, Northern Moravia, in a mousterian layer of similar temperate part of the last glaciation. The Šipka cave is only 75 km far from Mladeč caves (JELÍNEK, 1965; VALOCH, 1965). This geographical and chronological situation opens the question of the possibility or impossibility of the evolutionary transition between late middle palaeolithic neanderthal man and between early upper palaeolithic *Homo sapiens sapiens*. One part of specialists suppose that for the lack of chronological space the west european finds of classical neanderthals give no possibility of such an evolutionary transition. In this way the classical west european neanderthals are not considered as forefathers of modern man. The moravian finds concentrated on a relatively limited territory are therefore of the utmost importance.

The Kůlna Cave maxillary and parietal fragments bring us three sets of palaeoanthropological informations: first the characters represented in skeletal morphology, second the dental features and third the endocranial pattern related to brain morphology.

Important characters evident in skeletal morphology are the maxillary height, the morphology of the lower margin of the piriform aperture, upper palatal shape, absence of fossa canina, parietal bone thickness and transversal cranial vault.

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Maxillary height evident in the Kůlna maxilla in the prosthion nasospinale distance is 29,0 mm and therefore higher than the mean of the comparable dimension in european upper palaeolithic *Homo sapiens sapiens*. Nevertheless it ranks in the variability of the west european neanderthals as well as of the Modern man. The lower margin of the **piriform aperture** is well represented in the Kůlna maxillary fragment demonstrating a very small anterior nasal spine (Broca 0 - Broca 1) and doubled piriform margin, namely a narrow nasal sulcus. Both these characters are considered as archaic and are less represented in european *Homo sapiens sapiens* than in west european neanderthals. The breadth of the piriform aperture, so far as it could be reconstructed, was relatively broad as it is in most classical neanderthals and only exceptional in european *Homo sapiens*.

Studying the maxillary bone external morphology it seems that the **fossa canina** was not present. Unfortunately this part of the bone was not preserved but the bone in the immediate neighbourhood does not show the origin of a depression which should signalize the presence of **fossa canina**. It follows that if a fossa was represented at all, it was not a shape typical for *Homo sapiens sapiens*. The **upper bony palate** is evidently deep, which is an advanced character. If we advance to the **parietal bone** we note its thickness of 9 - 11 mm in parietal boss region. If this bone belongs to the same individual as the maxillary fragment, than it represents the remains of a 15 years old boy. In such a case its thickness is a high one, for *Homo sapiens sapiens* unusual. We should note that both remains – the parietal bone and the maxillary fragment –were found 20 m apart and that no other bony remains were found in 15 years' excavations. The parietal bone has conserved a part of open sagittal suture which signals the age less than 40 years. This opens the possibility of juvenile age. But even if it belongs to an individual of adult age, the bone is thick. An important cranial feature is the shape of transversal brain case section. This is evident when miror image of the right parietal is used. The transversal section is rounded as is usual with classical neanderthals and not roofshaped as is often with *Homo sapiens sapiens*. Summing up all our observations we can conclude that **in cranial remains the majority of illustrative morphological features is archaic**. Certainly they belong to different functional systems. Some are oro - facial, others illustrate the brain - case shape or thickness; functional roles of these characters are not always clear.

Second group of informations comes from dental remains. In the maxillary alveolar process we can see two empty alveoli after both incisors. Their roots were thick, 7,0 mm thickness for the second incisor is a large one. Remaining teeth are of normal size suiting the modern europeans. Their crown dimensions and corresponding length – breadth indexes are within the neanderthal as well as modern man variation. This means that in size the crowns are of advanced type. This is especially the case with both premolars and with the first molar. As for the dental morphology the premolars and the first molar are fully modern. On the lingual side of the canine there is a small cusp limited by two small vertical furrows resembling the cingulum. We conclude that the majority of dental features is advanced.

If we turn our attention to the endocranial morphology as it is represented on the internal face of the parietal bone, we find the most important feature the ramification of the Arteria meningica media (SABAN, 1984). If we are looking for the anatomical characters representing progressive evolutionary features best represented in modern man than the traditional mechanical division of the Arteria meningica media ramification variability into several types is irrelevant. The evolutionary trend is represented in more and more complex ramification and in increasing number of anastomoses between the arterial branches. These are the most important progressive characters signaling better blood supply for the physiological functions of the brain. In this way the Arteria meningica media pattern of the Kulna parietal bone is fully modern. Best represented is its anterior branch with numerous anastomoses especially in its bregmatic region.

Summing up, we have three groups of informations coming from the osseous and dental remains and from the endocranial features. The dental and endocranial features

represent no doubt two different functional systems and the osseous features demonstrated in maxillary and parietal morphology belong probably to several systems. Sometimes their functional adaptation is not clear. In this situation several archaic features can be recognized in cranial bone remains. The best evident are the transversal cranial vault, rounded in shape and the parietal bone thickness. These features are more prominent than few archaic features in dental remains which as a whole are evidently more modern in size and shape. The endrocranial pattern of Arteria meningica media is fully modern. From this fact follows that morphological features represented in different systems change in divers pace and the changes in divers components of those systems are not equally related.

Two additional remarks will help to understand: When in 1979 the Arago facial remains were published, a cranial capacity was calculated with the help of the frontal bone remains to 1.050 ccm (M.A. de LUMLEY, 1979). Later when parietal bone of the same individual was found 1160 ± 1200 ccm cranial capacity was calculated from these more complete remains (HALLOWAY, 1982). This means that different parts of the brain can have different pace of evolutionary changes. Whereas the Arago frontal part was of relatively low volume, the parietal region of the brain was more voluminous, more advanced in this morphological feature. The changes in volume in frontal and parietal parts of the brain were not equal.

Another example is the supraorbital region which is illustrated by a system of several morphological features developing and changing in divers pace and divers relationship. A respective supraorbital torus is not a simple feature but a system of features or components which can change in divers ways and relations.

The goal of this speculative exercice introduced by the study of the late neanderthal Kůlna cave remains is to stress three realities:

1. Not only one individual, in our case one fossil skeleton is not representative of the corresponding population and intrapopulation variability

2. but also a part of skeletal remains need not illustrate the whole individual.

3. The systems of morphological features and their components are related and develop in divers, often complex ways.

All this means that especially in morphologically transitional individuals different degree of changes can be found in certain characters also in a single individual. Only their detailed complex study in their morphological, functional, genetical, physiological systems and subsystems can contribute to understand the evolutionary transitions.

REFERENCES

HOLLOWAY R., 1982. *Homo erectus* brain endocasts: volumetric and morphological observations, with some comments on cerebral assymetries. *In: 1er Congrès International de Paléontologie humaine*, Nice, pp. 355-365.

JELÍNEK J., 1965. Der Kiefer aus der Šipka Höhle. *Anthropos* XVII, pp. 80-125.

JELÍNEK J., 1966. Jaw of an intermediate Type of Neanderthal Man from Czechoslovaki. *Nature* 5063, November 12, pp. 701-702.

JELÍNEK J., 1967. Der Fund eines neanderteler Kiefers (Kůlna I) aus der Kulna Höhle in Mähren. *Anthropologie* V/1, pp. 3-19.

JELÍNEK J., 1981. Neanderthal parietal bone from Kůlna cave, Czechoslovakia. *Anthropologie* XIX/3, pp. 195-196.

de LUMLEY H. et M.A., 1979. L'homme de Tautavel. *In: Dossier de l'Archéologie, L'homme de Tautavel,* 36, pp. 54-59.

SABAN R., 1985. *Anatomie et évolution des veines meningées chez les Hommes fossiles.* Paris ENSB - CTHS, Mém. 11, p. 289.

VALOCH K., 1965. Die Höhle Čertova díra und Šipka bei Štramberk. *Anthropos* XVII, pp. 80-125.

VALOCH K., 1967. Die Steinindustirie von der Fundstelle des menschlichen Skelettrestes 1 aus der Höhle Kůlna bei Sloup (Mähren). *Anthropologie* V/1, pp. 21-31.