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LATE ARCHAIC – EARLY MODERN HUMAN TRANSITION IN EASTERN EUROPE: A CASE OF LOCAL EVOLUTION BY SEXUAL SELECTION?

ABSTRACT: *This article uses Darwinian theory of sexual selection to examine the transition from archaic to anatomically modern humans. Using data from numerous skeletal remains recovered from the Upper Paleolithic site of Sungir in Russia, it argues that, in addition to natural selection, also sexual selection needs to be considered in our evolutionary scenarios.*

KEY WORDS: *Archaic hominids – Anatomically modern humans – Sexual selection – Local evolution – Sungir*

INTRODUCTION

After the discovery of a very late (36,000 B.P.) Neanderthal buried in Châtelperronian strata at Saint-Césaire, it has been widely believed that Châtelperronian, Szeletian and other Upper Palaeolithic industries which derived from the Mousterian were made by the Neanderthals (Stringer *et al.* 1984, Harrold 1989, Mellars 1989, Rigaud 1989). This view was largely speculative, because apart from Saint-Césaire itself, only teeth (also archaic) from the Châtelperronian layers at Arcy-sur-Cure have been used to support it. However, Sungir, an extremely important site situated near Vladimir, central Russia, and dated at 24 430 and 25 500 BP, has regrettably been neglected by most Western researchers, like many other sites in Russia. This site revealed an Upper Palaeolithic culture containing a number of Middle Palaeolithic elements and having common features with the Late Szeletian of central Europe and the Streletskaya culture of the Kostenki region (Bader 1978, 1984). Bader, who excavated the site, believed that its culture was of a rather recent Mousterian origin and had nothing to do with the Aurignacian.

DATA FROM SUNGIR

Skeletal remains of at least nine individuals have been found at Sungir. Most of them are quite fragmentary, but three skeletons (one male and two children) are well preserved and have been subjected to detailed studies by several specialists (Debetz 1967, Bunak 1973, Zubov, Kharitonov 1984). All the skulls (including the poorly preserved second adult skull) are anatomically modern, although a few archaic traits have been noted on the crania of the children (Trofimova 1984). The male cranium is very similar to Zhoukoudian Upper Cave 101 (Debetz 1967), but resembles also several European Upper Paleolithic specimens (Bunak, Gerasimova 1984). The second adult skull, whose sex is uncertain, looks quite Crô-Magnon-like (Gerasimova 1984). The teeth of children are very large and intermediate between those of Neanderthals and modern humans (Zubov 1984).

The postcranial skeleton of the male is largely modern but displays a number of archaic features. Specifically, high stature (181 cm) and characteristically Upper Paleolithic limb proportions (elongated distal segments of arms and

legs), are accompanied by an enormous shoulder width (the right clavicle is 190 mm long!) indicative of an extreme brachymorphy surpassing even that of the Neanderthals (Khrisanfova 1984). Other Neanderthal apomorphies noted by Khrisanfova include large, round and convex heads and large condylo-diaphysal angles of the humeri, high base of the 1st metacarpal, massive shafts and large condylo-diaphysal angles of the femora, very wide and relatively low patellae, very high tali, etc. The postcranial bones of the younger child are rather massive (possibly suggestive of Neanderthal affinities), while those of the elder one are gracile; however, both are very broad-shouldered, like the adult (Nikityuk, Kharitonov 1984).

In sum, it appears that although the skeletal morphology of the Sungir people is generally modern, they had retained several archaic traits, which are more pronounced in their teeth and postcranial skeletons than in their crania. How could such a mosaic pattern be explained?

SUNGIR MORPHOLOGY IN THEORETICAL CONTEXT

From the standpoint of the multiregional evolution theory (Wolpoff 1989a), the most plausible explanation would be that Sungir people, like other Upper Palaeolithic people of eastern Europe, descended from the Neanderthals and that in this specific case the cranial structures for some reason evolved more rapidly than did the teeth and the postcrania. This suggestion is clearly supported by the Mousterian-derived culture of Sungir.

The major difficulty, however, is that while Neanderthals with their shortened distal limb segments are well adapted to cold, the Upper Paleolithic people display an elongation of these segments, a feature characteristic of the tropical races, despite the fact that the glacial climate had become even harsher toward the end of the Würm (Trinkaus 1981, Jacobs 1985). The idea that longer distal limb segments of the Upper Paleolithic people were due to these people's more mobile way of life (Wolpoff 1989b) is disproved by the comparison of Near Eastern Neanderthals with the earliest anatomically modern humans in the same region, demonstrating that the latter took considerably lesser exercise than the former (Trinkaus 1992). So it appears that the difference between the Neanderthals and the Upper Palaeolithic people in limb proportions was not caused by *in situ* natural selection. Thus, population replacement should be regarded as a more important factor of change.

But is Sungir compatible with the replacement theory? Certainly not with its "narrow" version, according to which not a single European skeleton is intermediate between the Neanderthals and the modern humans, and thus there is no evidence of either transformation or hybridization (Stringer 1989). The "broad" version, allowing for hybridization (Roginsky 1949, Bräuer 1989), is easier to reconcile with Sungir data. Yet serious problems remain. First, why should these Upper Palaeolithic people, if they

really came from some other place, not just intermix with the Neanderthals but also adopt their archaic Mousterian techniques? This question, of course, applies to all the regions where cultural continuity is observed between the Middle and the Upper Palaeolithic. Second, if Sungir people are hybrids, why should they, without other factors being involved, resemble only one of the parental populations in an entire system (cranium) while displaying intermediate features in other systems (teeth, postcrania)?

To make these questions even more intriguing, it should be recalled that the earliest representatives of modern mankind, the Skhul – Qafzeh people, also show mosaic morphology, but the pattern is reverse. Here, it is the postcranial skeleton that is almost fully modern and very dolichomorphic, the teeth, despite being large, are also closer to the modern condition (Trinkaus 1989), but the skulls show quite a number of archaic features (see Corruccini 1992, for the latest assessment). The authors of the original description regarded this as an evidence of evolutionary change (McCown, Keith 1939), while others believed it to be a result of hybridization (Thoma 1957–58).

In this case, the first possibility should obviously be preferred. The primary reason is that the Skhul – Qafzeh group is quite early (*ca* 100,000 BP), and it may be suspected that the fully modern morphological complex did not exist at that time. Secondly, the crania of this group bear a certain resemblance to those of modern African and Australians (Brace, Tracer 1992, Stringer 1992), while the paleofauna of Qafzeh is Afro-Arabian (Tchernov 1992). Both facts, together with the mtDNA data (Stoneking, Cann 1989), point toward Africa, where this warm-adapted population or its ancestors could have originated. It is likely that adaptation to heat affected mainly the body build, making it more dolichomorphic, gracile, and modern, while the cranial structures were more conservative because of being less influenced by climate. The culture of these people was Mousterian because, single isolated technological events notwithstanding, the Upper Palaeolithic, too, did not exist at that time.

Interestingly, a similar morphological pattern (almost modern "warm adapted" postcranial skeletons, and skulls which are considerably more archaic) is seen in much later Upper Palaeolithic samples from central Europe – Mladeč and Předmostí. "It is hard to explain," Wolpoff (1989b) writes, "why these earlier Europeans, who maintained an ongoing adaptation to the frigid conditions of the later Würm, have much higher brachial and crural indices than living Lapps or Eskimos". The simplest answer would be that they inherited these indices from the Near Eastern populations of the Skhul – Qafzeh group. Having arrived in Europe with the Aurignacian tradition, which has no roots in this region and most likely originated in the Near East (Klein 1992, Mellars 1992), they either did not have time enough to develop morphological adaptations to the cold, or adapted by more efficient cultural means. This was easier for them than for the Neanderthals since their

culture was superior. Natural selection, however, continued to operate as well, because toward the end of the Upper Palaeolithic the body proportions in Europe shifted back to the Neanderthal norm (Jacobs 1985).

However, compared to the Skhul – Qafzeh sample, Mladeč, Předmostí, and other central European Upper Palaeolithic crania look more Neanderthal (Wolpoff 1989b). One of the reasons may be that these people descended from, or mixed with, the Neanderthals—however not in Europe but in the Near East. The known Levant Neanderthals admittedly show little difference from the European Neanderthals in body proportions, but this may be because they are rather early (at least 20,000 years earlier than the central European Upper Palaeolithic people). They apparently came from the north (Tchernov 1992) and did not have enough time to adapt to warm climate. These adaptations could have developed in the course of the subsequent evolution.

DISCUSSION AND CONCLUSIONS

But what about Sungir people? In my opinion, they are related not to Aurignacians and their descendants, but to Châtelperronians and other Upper Palaeolithic Neanderthals, just as their archaeological inventories indicate. In fact, some archaeologists have independently arrived at the same conclusion (Anikovich, this issue). Anatomically modern people of Sungir, then, represent the final stage of the succession which begins with the Saint-Césaire Neanderthal.

To reconcile this view with the maladaptive nature of the Upper Palaeolithic body build in Europe, we must consider one more factor which has been almost neglected so far — sexual selection.

The scenario might be as follows. After the anatomically modern Aurignacians arrived in Europe with a culture superior to that of the local Neanderthals, the replacement process began. If, in their almost hopeless struggle, the Neanderthals had a faint chance of survival, their only adaptive strategy could be assimilation. One way to achieve it was to adopt the Upper Palaeolithic culture (which, as we know, some of them actually did), another, to hybridize with the invaders. That hybridization did occur, is evidenced by the fact that of all the modern races, Caucasoids seem to be the least distant from the Neanderthals (Roginsky 1949), and this is especially true of north-western Europeans (Coon 1939, Brace, Tracer 1992).

Under such circumstances, looking "less Neanderthal" and "more Upper Palaeolithic" could have been selectively advantageous, and this advantage could have resulted in a trend toward a more modern (and more dolichomorphic) morphology. This would mean that the transformation of archaic humans into modern ones occurred again in Europe (and possibly elsewhere) long after it had first taken place in Africa or the Near East.

Indeed, while most researchers believe Saint-Césaire to be fully Neanderthal, Wolpoff (1989b) has noted some isolated modern features even in this specimen. Eleven millennia, or 440 generations, separating Sungir from Saint-Césaire would probably have sufficed for the postulated mechanism to produce an appreciable amount of evolutionary change. For obvious reasons, structures most important for sexual selection (face, body proportions) would have evolved most, while minor details of the skeleton and teeth would have "lagged behind."

Climatic selection, however, operated as well, and, with regard to body proportions, its direction was exactly opposite to that of sexual selection (Jacobs 1985). This "struggle" between the two forms of selection could have resulted in contradictory combination of traits, like those seen in Sungir (high stature, elongated distal limb segments, and enormous shoulder breadth). The head structures, which, compared to body proportions, were probably more affected by sexual selection and less influenced by climatic selection, could have evolved more smoothly and rapidly.

Indeed, the face of Sungir man looks even more modern than those of the roughly contemporaneous people of Předmostí. The possible reason is that, descending from the colonizers and thus belonging to the dominant community (that is, being full-fledged, not newly-made, Upper Palaeolithic people), these central Europeans, in contrast to the descendants of the aboriginals, could afford not to care about their appearance and were not subjected to sexual selection of the "anti-archaic" type.

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