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Ecological twin species and some obscure questions of hominidae evolutions

Ecological twin species are closely related species inhabiting the same ecological niche. Both micro- and macroevolutions proceed faster in a twin system than within a single species.One proposed hypothesis is that the acceleration of hominoid evolution was caused by the existence of ecological twin species. The complementary species for Homo habilis and Homo erectus were Australopithecus species. Both paleontological and cryptozoological data suggest that Homo sapiens has a complementary species as well. A small population of the latter may still exist today. Specific interaction within the system of two species explains the difficulty in detecting ecological twins of the species. The existence of a hypothetical human species provides the basis of popular talk of a "wildman".

Key words - Evolutionary ecology, human evolution, "wildman"

Strange as it may be, there is no generally accepted definition of man. Two definitions are possibile, one biological and one social. The biological definition is based on morphological and physiological characteristics. The social definition refers to material culture, production of exchange, market relations or their prerequisites. Tool use cannot be a part of the definition, because it is praticed by apes as well (Language of Primates, 1983). The use of fire and articulate speech are typical of man alone, but these criteria are not really detected in the fossil records.

Paleoanthropology recognized two species of fossil man: Homo habilis and Homo erectus (Johanson, Eadey, 1981, Lambert et. al., 1987). Both were men from a biological point of view, and yet they were close to animals from a sociological viewpoint. Their material culture was infinitely more primitive than that of Homo sapiens The fossil ape, Australopithecus, had rudiments of culture too. Only Homo sapiens may be considered a complete man from a sociological standpoint. Some tens of thousands of years ago, the emerging social relations laid the basis of ancient civilization. Hence, there are two main points in human history. 1) The emergence of man in a biological sense (more than 2,000,000 years ago) and 2) The appearance of society in a sociological sense (about 50,000 years ago). The first stage is connected with the appearance of the species H. habilis. The second is not linked with speciation per se, because it concerns a new race formed within the species H. sapiens. Let us examine some general points of these two historical stages. To begin with, I formulate a hypothesis. It is based on an article by G. Gause and B. Porshnev.

Gause (1934) formulated the law of competitive exclusion according to which only one of the close species may inhabit an ecological niche. According to Porshnev (1963, Porshnev et. al., 1986), the conflict and confrontation between our ancestors and Neanderthal people united our ancestors and contributed to the development of social organisation.

The idea had a flaw because Porshnev considered Neanderthals to be a separate species. The present version is that they are a race of sapiens man. However, the central idea of this scientist of

the historical role of competition between two branches of Homo appears to be right. My main idea is based on the synthesis of the Porshnev and Gause ideas and the modern paleonthological paradigma.

Natural selection, that is, the preservation of the favoured races in the struggle for life, is an important evolutionary factor (Darwin, 1859). The struggle for life has two variants, inter- and intraspecific. The most acute struggle takes place between closely related species within the same ecological niche. The struggle between races and families of the same species is not so uncompromising because all the specimens are part of the same genetical system. The principles of interspecific competition are common for the whole organic world (Gause, 1934, Sapunov, 1985, Lotka, 1925, Wolterra, 1926). Let us define closely related species as ecological twin.species. According to our data on insects, the introduction of new ecological twin species induces stress in a host population (Sapunov, 1985). The phenotypical variability and evolutionary potential of both populations increase. In a finite niche (laboratory situation) the struggle may lead to the extinction of one species. As a limited niche is rarely found in nature, there is usually a divergence of species. Confrontation between closely related species may lead to speedy microevolution which increases differences between species (Mayr, 1971). All possibilities of ecological divergence are at play. The speed of evolution being variable (Lewin, 1980 et. al.). A period of relative stability is followed by a period of quick evolution and vice-versa. The unevenness of evolution has its reasons. One of them is the periodical appearance of ecological twin species. This is the result of the different evolution of two species derived from the same ancestors. A system of twins evolves more quickly then a single species. Let us summarize the main characteristics of the coevolution of ecological twin species, using the literature (Mayr, 1971), our data (Sapunov, 1985) and mathematical simulation (Wolterra, 1926).

1. High speed.

2. Maximal increase of main differences between species.

3. High speed of increase of population and range. Population of the first species increases, population of the second decreases.

4. Moderation of microevolution of species according to domination of one of the species.

According to Darwin (1859), evolution is extremely gradualistic. He was sure that natural selection acts through the preservation and accumulation of infinitesimally small inherited modifications, each being profitable and preserved. According to the present point of view, macroevolution takes place by a punctuational model, that is, it is sudden. Microevolution is gradualistic see Figure 1 (Stanley, 1982). Let us consider the possible combination of the two types of evolution (fig. 2). Adaptive radiation divides any species into various forms. The most distant forms change to survive (Darwin, 1859). Races that are the most distant from the common stem may form a new species, which appears after a macroevolutionary jump (Lewin, 1980). This is the moment when the twin species appear. Competition and reciprocal selection pressure push them apart. The differences between the species increase and they continue to diversify. The probability of contact

TABLE 1

H. sapiens	ecological twin species
complicated behavior	relatively simple one
weak muscles	strong ones
day activity	night activity
weak sense organs	effective ones
naked body	body covered by hairs
material culture	absence of one

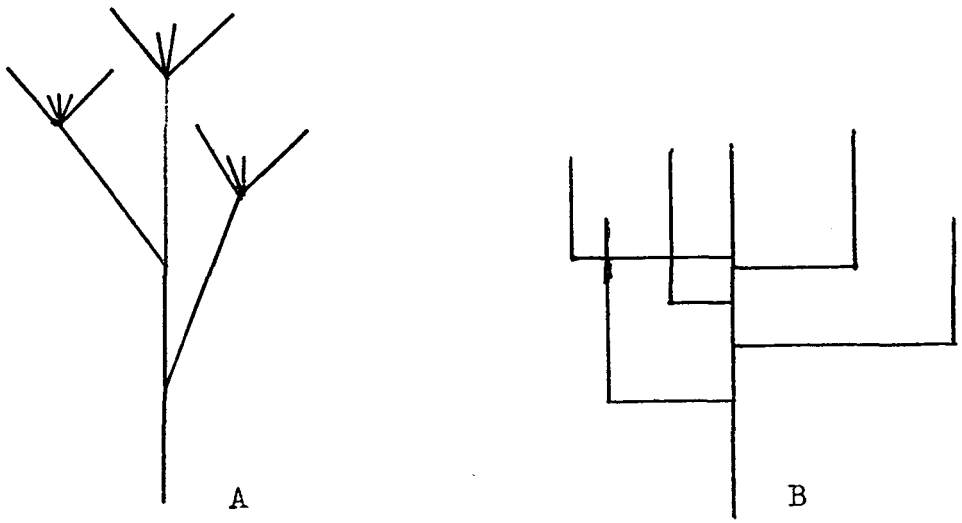

Figure 1 - Gradualistic (A) and Punctualistic (B) evolution

between them becomes minimal. This scheme shows the connection between micro- and macroevolution. An example of fast co-microevolution of twin species is provided by an interaction between cockroaches, Blattela germanica and Blatta orientalis. The interaction resulted in the extinction of the second species and the high rate of proliferation of the first. Let us use the idea of twin species to analyse the evolution of hominids. This young primate family is known to have evolved very rapidly. What is the reason?

According to modern data (Johanson, Edey, 1980 et. al.), the oldest hominid is A. afarensis (2,000,000 or more) - see Figure 3. It diverged into both A. africanus and H. habilis. Hence, divergency was a prerequisite for the emergence of man. A subsequent evolution took place

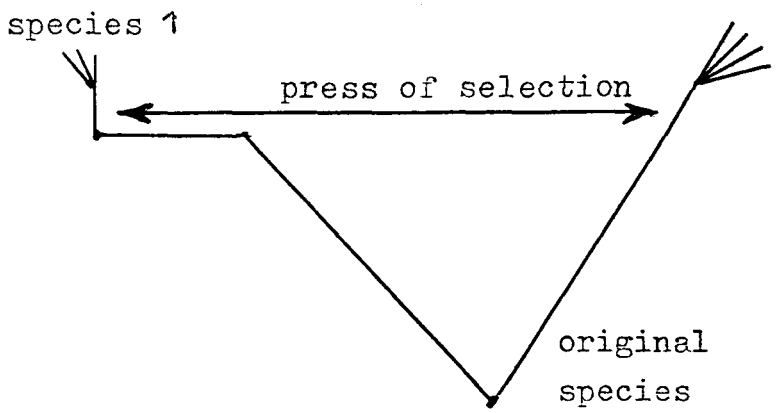

Figure 2 - Evolutionary plan that takes into account the ecological relationship between twin species.

within the system of the two species, A. africanus - H. habilis (1) and A. robustus - H. erectus (2). Unfortunately we have no correct estimation of the phylogenetic dating of the species. We have no satisfactory classification of Australopithecus species. Some authors consider A. africanus and A. robust*us* as females and males of the same species (Lambert et. al., 1987). We should now consider the contraposition of Homo and Australopithecus species.

Then the latter became extinct. About 1,000,000 years ago a new hominidae species arose, that is, H. sapiens. Having no twin, it began to proliferate in accordance with the law of adaptive radiation. Two forms of man began to develop,the gracile and the massive (classical) Neanderthals. The first group are ancestors of H. sapiens sapiens. Massive Neanderthals are represented by the fossils sites of la Chapelle-aux-Saints and la Moustier, the gracile form by those at Eringsdorf (Lambert at. al., 1987).

Some tens of thousands of years ago, the first group embarked on the road of social evolution per se. Their rise from the animal world became irreversible. What was the cause of the process? A big brain could hardly be the main cause as some prehistorical hominids had a big enough brain to start a complicated material culture. According to the latest data (Language of Primates, 1983), apes are capable of studying English, the use of computers and so on. At the same time, apes have no craving for knowledge of the development of material culture. H. sapiens had this craving and the reason for it may be sought on the basis of the hypothesis of ecological twin species. Gracile Neanderthals followed the general direction of hominid evolution. There are minimal morphological differences between them and modern man. Massive Neanderthals missed the general path of human evolution.Their culture became more primitive than the culture of sapiens man. The high speed of biological evolution of massive Neanderthals was the prerequisite of the macroevolutionary jump. Human history would be clearer, if we considered the possibility

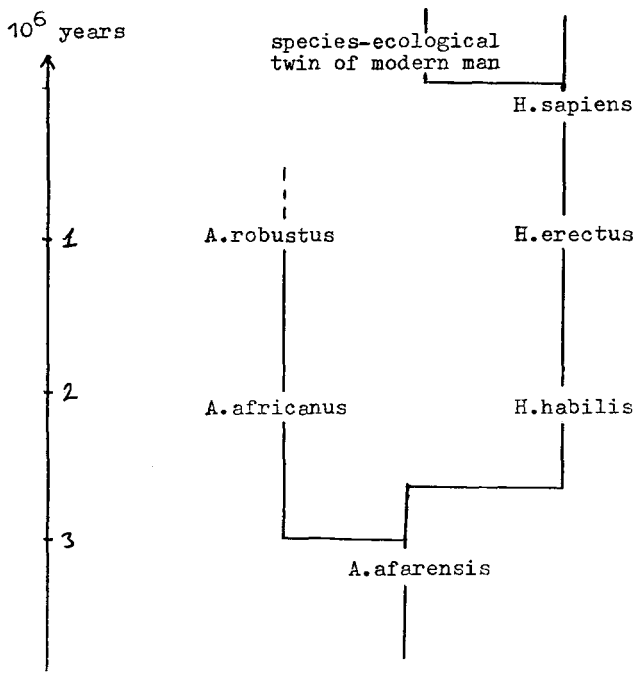

Figure 3 - Possible plan of Hominid evolution

of the appearance of a new species from massive Neanderthals about 50,000 years ago. Ecological twins began to press on H. sapiens. This pressure was the cause of new adaptations. Competition of both species for the ecological niche was the cause of the rapid human evolution. The evolution of our ancestors resulted in the emergence of the highest nervous activity without the help of morphological progress. This in turn leads to social progress, which came to be an effective way of survival.

Our ecological twin species had to develop in an alternative way, that is, through biological adaptation. It called for strong muscles and highly developed sense organs. The diverging evolutionary path tended to increase the differences between the two species. Our ancestors were active in the daytime, the opposite species was active at night and developed night vision. The ecological twin species of H. sapiens sapiens must be viewed as man from a biological point of view and as animal from a social viewpoint. The table shows the main differences between species.

A possible mechanism of their divergency is reciprocal negative taxis (phobia). Both species must have negative reciprocal phobia. We must associate the image of the twin species with something terrible. This horror must be irrational, as scotophobia, (horror of darkness).The opposite species must be afraid of us. Our species won the evolutionary competition. Our path appeared to be more progressive. The stronger the competition was 50,000 years ago the more differences there are between species today. The competition was very strong. Both species were progressive and widespread and their confrontation went on all over the Earth. According to Porshnev (1963) conflict between our ancestors and "non-humans" forced our ancestors to unite. This process of consolidation leads to the appearance of ancient civilization. I may add that the conflict was the personification of the fundamental law of evolutionary ecology. Reciprocal repulsion may induce a paradoxal situation. Our twin species was able to become "invisible" for us. Having very keen senses this odd species manages to avoid undesirable contact. Hence, the hominid evolution of the last thousand years is the evolution of a system of interacting species. The first is ourselves, the second is predicted. The latter is usually an animal species. At the same time the relationship between ourselves and a hypothetical species is quite unique. The greater our population, the smaller the population of the opposite species. Some reproducing populations of the probable species may be alive in the hidden and wild regions of the Earth. The hypothetical image of this species may be embodied by the "wildman" ("abominable snowman", "big foot") and so on. Information on these creatures is collected by a science called "cryptozoology", dealing with rare and probable animals. An analysis of the "wildman" testimonies suggests the presence of real biological species (Sapunov, 1988). Based on testimonies, we conclude that they are not contradictory and are in agreement with modern ecology and genetics.

The future study of the interaction between us and a hypothetical twin species would help in understanding the nature and origins of man.

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Received 20 July 1993 *Accepted 21 March 1994*