The Troglodytidae and the Hominidae in the Taxonomy and Evolution of Higher Primates

... it is high time certain postulates in primatology and anthropology were rewritten...

A paper by Boris F. Porshnev, Moscow

The present crisis in current ideas on the evolution of higher primates (Porshnev 1966) calls for revision of certain postulates and rehabilitation of the Haeckel and Vogt hypothesis (1866-68) of a "missing link" between apes and man. Haeckel and Vogt called this hypothetical form "ape-man" (or "man-ape"), but in accordance with the rules of taxonomy Linnaeus's term Homo troglodytes or simply troglodytes should have been used. H. Troglodytes, according to Linnaeus, is a species characterized among other things by hairiness of the body and absence of speech. In the last hundred years, especially since Dubois's discovery of Pithecanthropus bones in Java in 1891-94, a fairly large amount of fossil material, representing many species of extinct bipedal higher primates has been collected. The generally accepted evolutionary interpretation of this material seems to me incorrect: all these species (except Australopithecus and Meganthropus) are bracketed with man. Linnaeus and Haeckel and Vogt would have classified them as troglodytes, or ape-men, having affinity to man in morphology, including bipedal locomotion, while lacking the higher cerebral functions, which make speech and reason possible. Under the pressure of philosophical concepts, this fruitful idea has been almost totally abandoned in this century. Darwinian evolutionism (and the corresponding view of Engels) has been weakened by the concept of man's direct descent from apes without an intermediary zoological link. Now we can restore this link by embracing in taxonomy all the extinct and living forms belonging to it.

The main criterion for placing fossil forms in the family Hominidae is in practice the presence of accompanying stone implements. Such practice contradicts the purely morphological principle of classification. The creature discovered in Africa that was first named Pre-Zinjanthropus and later Homo habilis made crude pebble tools but had the brain of an anthropoid. Nonetheless it is considered that the discovery of Pre-Zinjanthropus increases the antiquity of hominids ("humans") some 2,000,000 years. At the same time, the contemporary and subsequent morphologically similar Australopithecinae are set apart as a subfamily, for their tool making is considered doubtful or rudimentary. The geologically contemporary Meganthropus and Gigantopithecus are not included in the Hominidae at all, because they made no tools.

Bunak (1966:536) interprets Paleolithic stone implements as "exosomatic organs." Their production was to a high degree a stereotyped and automatic function: only slight changes of the prevailing pattern occur over a period of about 1,000 generations in the Lower Paleolithic and over a period of about 200 generations (taking a generation as 30 years) in the Middle Paleolithic; such ethological changes lie quite beyond the level of consciousness. The psychotechnical analysis of Paleolithic tools shows that the process of their production did not involve speech, but was sustained by automatic imitation within populations. Modern neurophysiology and neuropsychology have found it possible to locate in the brain areas of speech control and its bearing on behavior in that destruction of certain fields and zones in the frontal, temporal, and sincipital regions of the cortex renders the above-mentioned functions in one

respect or another impossible; and these particular fields and zones are developed only in H. sapiens (Shevchenko 1971). The comparison of the data of the morphological evolution of the brain of fossil hominids and the study of aphasia excludes the possibility of articulate speech in the pre-H. sapiens stages of evolution, and the concept of inarticulate speech is rejected by psycholinguists as senseless.

Hence, it is advisable to abandon the current practice of including all bipedal higher primate fossils in the Hominidae. It is preferable to include in this family just one genus, Homo, represented by a single species, H. sapiens (subdivided into H. sapiens fossilis and H. sapiens recens). The main diagnostic distinction of the Hominidae is the presence of those formations in the structure of the brain which makes speech possible and the correlative features in the face (Porshnev 1971). All the other bipedal higher primates should be embraced by the family Troglodytidae (or Pithecanthropidae), whether they made tools or not. Their main diagnostic distinction from the family Pongidae is bipedal (erect, orthograde), locomotion, with all the correlative features in the structure of the body, head, limbs, and internal organs. The Troglodytidae (or Pithecanthropidae) may be subdivided into the following genera: (1) Australopithecus, (2) Meganthropus, (3) Pithecanthropus (Archanthropus, (4) Troglodytes (Paleanthropus), subdivided into Troglodytes fossilis and Troglodytes recens. This fourth genus (commonly known as the Neanderthal) can in its turn be divided into the following species: (a) Southern (Rhodesian type), (b) Classical (La Chapelle type), (c) Presapient (Steinheim-Ehringsdorf type), (d) Transitory (Palestine type).

The family Pongidae branched off the Primate tree in the Miocene. Currently it is represented by four genera: the gibbons (sometimes separated as a distinct family), the orangutans, the gorillas, and the chimpanzees. The family Troglodytidae diverged from the anthropoid line in the Pliocene. At present it is represented by one genus, probably one species (Troglodytes recens L.sp.?), which can be described as "relic hominoid" (Porshnev 1963, 1969). From the hominoid line (Troglodytidae) in the Upper Pleistocene there separated a family of hominids in which the tendency towards the formation of species did not prevail and which from the very start and up to the present has been represented by the species H. sapiens. The taxonomic rank of family for H. sapiens is justified by the greater biological significance of such new formations as the organs of speech, i.e. the second signal system. The unusually fast tempo of their evolutionary progress (naturally, on the basis of useful variations of ancestral forms, i.e. late Paleanthropus) indicates a mechanism of selection somewhat akin to artificial selection. In this comparatively speedy divergence the two species were juxtaposed in such a way that connecting links were washed away. This process was intimately connected with the genesis of the second signal system (Porshnev 1968a). The question is open now which species of Paleanthropus (Troglodytes fossilis) was the direct ancestor of H. sapiens fossilis. Perhaps we shall know this when study of the relic Paleanthropus yields serial morphological material, for there can be no doubt that the Troglodytes recens L. is a direct left-over of the divergence of the Troglodytidae and the Hominidae. Therefore study of these relics becomes a cardinal objective for the theory of anthropogenesis (Porshnev 1966b).

The thesis that all Paleanthropus forms died out or were assimilated almost immediately (not more than 3,000 years) after the appearance of H. sapiens is totally a priori and biologically absurd. Neanderthaloid skeletons found in the more recent strata of the earth, including some of the various periods of historic time, are looked upon as "pseudo-Neanderthal." The argument here is based on the absence of Mousterian tools, though this can be explained by the above-mentioned divergence resulting in the disappearance of the transitional forms and in the new ecology of relic Paleanthropus. Archaeological and historical evidence shows the latter's coexistence with man, sometimes in symbiotic

relationship, sometimes in parasitic relationship with various species of the Carnivora and Herbivora, and, lastly, in more recent time, subsisting vicariously in the most deserted but ecologically varied biotopes.

The highest possible degree of negative adaptiveness of relic Paleanthropus to man, on the one hand, and its great outward likeness to man, on the other, jeopardize its study and explain why primatology and anthropology have fallen so far behind on this problem. It is precisely the use of nontraditional methods, such as the comparative analysis of mutually independent evidence that has made it possible to establish the existence of this relic species and to describe its morphology, biogeography, ecology, and behavior. In other words, fact-finding methods have been used in biology that are usually employed by historians, jurists, and sociologists. This indirect research into the problem of relic Paleanthropus is now considerably advanced. Yet the road traveled so far can only be described as the initial (though perhaps the hardest) stage of research. The way is not yet clear for the next step — the planned acquisition of a specimen, living or dead. The state of research on the problem allows one to think it is high time certain postulates in primatology and anthropology were rewritten.

The above idea was sent to the same scholars who were invited to comment on the papers of Butzer, Tuttle, Todd, and Blumenburg in this issue. The responses are printed below.

Comments

by Emilliano Aguirre De Enriquez, Madrid, Spain

Before discussing the central ideas of this paper, I would point out several inexactitudes in its assumptions.

I do not think it is proper to say the "the presence of accompanying stone implements" has been "in practice" the main criterion for placing fossil forms in the Hominidae. Quite a number of authors classify Australopithecus in this family, but not many of them attribute to him the making of stone artifacts. "Meganthropus" is also normally included in the human family, but the reason for not including Gigantopithecus is, I think, its probable phylogenetic relationship with Pongo and the dryopithecines from the Miocene of Asia.

Porshnev estimates a 1,000-generation (of 30 years) duration for the Lower Paleolithic. If we take into account the fact that more than 2,000,000 B.P. as a minimum age for the Oldowan industry and that of Lake Rudolf and the fact that the Middle Paleolithic is considered to begin with the lithic techniques of the Riss, not more than 200,000 years ago, this makes more than 60,000 generations; on the other hand, the middle Paleolithic is considered to have lasted until less than 40,000 years ago, more than 5,000 generations and not 200.

We cannot underestimate the technical progress, and doubtless the concomitant social and linguistic differentiation, of the Middle Paleolithic, generally associated with Neanderthal man; the brain size of this fossil forbids its exclusion from either the hominids or the genus Homo and the human species.

The author at first seems to exclude ethological criteria from taxonomy, but throughout the paper defines the "Hominidae" and discriminates the "Troglodytidae" on cultural and psycholinguistic criteria. The morphological differences supposedly indicative of progress into conceptual language are insufficient for a classification and zoological diagnosis at the family and even the generic level.

We cannot exclude, either from the human family or from the genus Homo, the pithecanthropines, which probably interbred with H. sapiens (maybe in the population of Omo I and II; see Day 1969, Thoma 1966). Kochetkova (1970) claims for H. erectus, a relevant development in the language areas of the brain, and we may think that it had a remarkable capacity for abstraction and organization (Aguirre 1966).

The cultural progress of modern man has been faster in recent times, but its continuity has been unbroken in the process — slow at first, for lack of experience, but later increasing exponentially. A clear break cannot be introduced as the author does, except a priori and on the basis of criteria quite foreign to biological science, through the use of which we risk going back centuries to the time before the advent of positive science.

Let us look for a specimen, alive or dead, of an infra-man, but let us not classify it before we find it, or prepare a taxonomic trap for it to justify an arbitrary speculation — or we will have returned to the old racism of the "encomenderos" against which Las Casas, Vieira, Acosta, and Pope Paul IV defended the human nature and human rights of the American Indians.

Comment

By Bennett Blumenberg, Newtonville, Mass., USA

Recent studies conducted with Pan have shown that this ape possesses the ability to learn the language Yerkish via a computer-controlled training system (Rumbaugh, Gill, and Von Glaserfeld 1973). Chimpanzees have also been taught to use plastic objects as words and thereby acquire a vocabulary of over 100 words as well as the concepts of class and sentence structure (Premack and Premack 1972). It has long been known that chimpanzees do not posses a larynx which would allow them to speak either Russian, Chinese, or English. In any case, due to the wealth of data which is strongly and indubitably suggests that (a) silences is golden and (b) most Homo vocalize in excess, it should now be obvious to everyone that Pan should really be sunk in the genus Homo and that the creature (or hominoid) previously so designated is but a regional hairy variant which merely indicates the polygenetic variability contained within the human race.

Comment

By Subhash Chandra Malik, Simla, India

In reacting to Porshnev's ideas about reclassification of the higher primates, there are so many differences that one does not know where to begin. I agree with him that urgent rethinking and the use of non-traditional methods are required, but his arguments for taxonomic reclassification seem very far-fetched and certainly not very convincing. For example, while his idea is sound that classificatory designations should not be based on the presence or absence of artifacts unless supported by several morphological features that suggest humanization, we cannot ignore the fact that "exosomatic organs" — implements — which may have been used by the early forms do represent a crucial humanization process. He discusses these implements simply as stereotypes that functioned automatically. Of course, the evidence of lithic tools does indicate that for several generations only slight changes were visible, yet this cultural — symbolic — representation of artifacts from the behavioral viewpoint is a reflection of the presence of a degree of consciousness, and perhaps even a rudimentary form a speech, among proto-hominids. But more than this, the concept of automatic imitation of implements makes our ideas about cultural tradition and change absurd. At any rate, we cannot base our conjectures on the surviving material, because all inferences from ethnographic parallels and other generalizations suggest that bone and wood tools were in everyday life long before stone tools were made. That is not to say that there is a direct correlation between technology and aspects of socio-cultural development. But technologically simple societies may have extremely elaborate kinship relationships, both among themselves and with other groups. What makes this even more plausible is that the early proto-hominids, including Ramapithecus and its varieties as well as he australopithecines, lacked such morphological features as could have served as a "natural" defense against predators. This development further suggests that some brain complexity was already present. This is why early human and pre-human societies had the ability to adapt to different ecological zones. In short, humanization implies that several features, including levels of consciousness, reason, and elementary forms of speech, along with such physical features as bipedalism, development of the hand and foot, etc. were interacting simultaneously towards "Man-hood." There is little likelihood of a lineal progression and clear categories, if we are to be realistic in the context of fossil evidence and current ideas about evolution. More over, the use of such terms as "relic species," "direct left-overs," etc. is misleading. Of course, all this does not mean that stone tools as such should be used as major criteria for morphological evolution in taxonomy. But in a discussion of morphological; features, cultural indicators cannot be ignored, for they represent complex evolutionary developments, all of which together humanized the species. We must of course bear in mind the distinction between cultural and biological features, though even here borderline cases will always create complex problems.

Comment

By Frank E. Poirier, Columbus, Ohio, USA.

It seems appropriate to begin with a request for more frequent communication with our Russian colleagues; this article suggests that it would be mutually profitable. It is difficult to comment adequately on this article, for because of its brevity, much of the requisite information is omitted or summarized to the point where the article suffers. As an example, what is meant by "the present crisis in current ideas on the evolution of the higher primates"? Is it a lack of material, a lack of interpretable data, or a lack of new ideas? A literature review suggests that we lack neither of the later two.

Furthermore, what is the "mutually independent evidence that has made it possible to establish the existence of this relic species"? Is Porshnev referring to contiguous archaeological data? As a major point in his argument, this evidence should be presented. I would also be most interested in hearing more about the "planned acquisition of a specimen, living or dead" of the so-called relic Paleanthropus.

Porshnev's work suffers from undefined, poorly defined and ambiguous terminology. Porshnev declines to include Australopithecus and Meganthropus in his category of "man," for which we can assumedly substitute "hominid." Such intransigence will receive vehement opposition from numerous scholars. His claim that inclusion in the family Hominidae depends on the presence of accompanying tools must be rejected. He makes this clear himself by pointing out that Australopithecus is denied hominid status, though he argues that this is because australopithecine tool making "is considered doubtful." This is unlikely to be accepted by many scholars.

Porshnev's description of Homo habilis's brain as "the brain of an anthropoid" requires justification. Furthermore, his contention that Australopithecus and Meganthropus, and by implication all hominids prior to H. sapiens, lacked the higher cerebral functions allowing speech and reason is speculative. We might also question the assertion that "psycho technical analysis of Paleolithic tools shows that the process of their production did not involve speech, but was sustained by automatic imitation." The statement is intriguing, and may be true. However, what is the evidence? How many assemblages have been analyzed with this in mind?

Porshnev's taxonomic practices are questionable. Was the family Hominidae merely established to hold "all other bipedal higher primate fossils"? The taxon is defined by traits other than bipedalism. I will leave it to taxonomists to ponder Porshnev's nomenclatural scheme. However, I wonder about the justification of assigning a taxonomic nomen to a hypothetical creature. Furthermore, I see no value to Porshnev's proposed taxonomy, and categories such as Troglodytes recens, among others, simply confuse matters. Further confusion is generated by such phrases as "relic hominoid." How does one define such a creature? What is the utilitarian value of such a category? One other question: What is "negative adaptiveness"?

Comment

by Bruce E. Raemsch, Oneonta, NY, USA.

If there is indeed evidence that speech among hominids is as recent a development as indicated by Porshnev, and that Neanderthal man is excluded from the H. sapiens taxonomy because he did not have speech, then certainly discussion should develop.

The discussion should rest upon the evidence available to support Porshnev's claim that speech was absent in all hominids but H. sapiens sapiens (Porshnev's H. sap. fossilis and H. sap. recens) and should deal effectively with the mechanism that made possible the rapid appearance of functional development structures in the frontal lobes of the primate brain we are sure were present in some prehominid primates as a result of studies on living primates. "According to von Bonin, area 44 [Broca's area of

speech localization] is present in all primates and the inferior frontal convolution in which it occurs in man can no longer be considered a specific human brain region" (Larsell 1951:459).

Further, it is difficult to understand why Neanderthal man, with the brain potential equal to that of H. sapiens sapiens, would not have had the functional capacity of speech. Since we cannot now examine the neuro-anatomical structures for speech in Neanderthal man (defined as he has been through his classical morphological characteristics), it appears to me we have little evidence and even less reason for excluding him from the H. sapiens taxonomy.

Though in some respects it does seem "a priori and biologically absurd," as Porshnev states, that (as some would explain the problem) "all Paleanthropus forms died out or were assimilated almost immediately . . . after the appearance of H. sapiens," it is no more so than the "unusually fast tempo of this evolutionary progress [of speech development which] indicates a mechanism of selection somewhat akin to artificial selection" posed by Porshnev. If natura non facit saltum (to quote Darwin) applies to the former idea, it applies equally to the latter.

Boris F. Porshnev died while his article was in press; his colleagues Dmitri Bayanov and Igor Bourtsev of the Russian Darwin Museum in Moscow agreed to reply to the comments.

Reply

By Dmitri Bayanov and Igor Bourtsev, Moscow, USSR

We are grateful to Sol Tax for acquainting CA readers with Porshnev's anthropological idea and for giving us the opportunity to discuss them here. The vastness of the problems embraced by the Porshnev theory, its (in our opinion) truly revolutionary character, and the fact of its presentation for discussion in an overly summarized form make many queries on the part of the reader inevitable. Besides, as we see from the comments, Porshnev's works are not known to those who kindly agreed to take part in the discussion. Therefore we would like to provide an explanation of our late colleague's theory before answering concrete questions and comments offered by his critics.

There are two cardinal notions in anthropology on whose mutual relation the very essence of this science depends: man and animal. In pre-Darwinian times the relation between these notions was of one kind, in post-Darwinian times of another, and the changeover from one to the other signified an unprecedented revolution in man's though and world outlook. Before Darwin, a supernatural schism divided animal and man; after Darwin, we accept a natural affinity and transition between one and the other. But the more science tries to solve the riddles of this transition, and the deeper in time it looks for minute details of it, the less distinct the notions of man and animal become, so that one is left with the question, "Transition from what to what?" To understand the origin of man, we have to know exactly what he is, and to know what we have to understand his origin.

Porshnev offered to break this vicious circle by restoring and re-emphasizing the difference between the notions of man and animal, but this time on a scientific basis. In fact, his theory is a colossal attempt

to stress and define the uniqueness of man in light of modern science.

Science consists of facts and their interpretation. America is a fact of geography; Columbus's taking it for India is a famous example of interpretation. Let us state from the outset that Porshnev never quarreled with facts, but he was up against some very sacred interpretations.

How could science possibly go awry in interpreting facts of paleoanthropology? First of all, by uncritically using the ready-made, unscientific, pre-Darwinian, intuitive concept of man in the study of fossil material. When skeletal remains were found that looked much more manlike than apelike, scholars, without much further thought, started labeling them "man." Thus such terms as Java man, Peking man, and Neanderthal man came into usage. Using a familiar name for an unknown thing, one inevitably imagines that unknown entity in terms of the makeup of the familiar one of the same name. In other words, images of ourselves were projected into the unfathomed past, and once placed there they began to be treated as facts of prehistory.

Another possible cause of misinterpretation in paleoanthropology is the fact that this science is manned by osteologists, who know everything about skulls and very little about their contents, while it is the latter and not the former that have anything to do with the life of all brainy creatures.

A third cause is the fact that modern evolutionary anthropology was born in Western Europe, and the closest living animal relatives of man known to the European scientist were representatives of the Pongidae. The evolutionist's thought could have taken on a somewhat different direction had he set eyes on a Troglodytes recens.

The sacred interpretations challenged by Porshnev are (1) that primate bipedalism is sufficient for human status; (2) that any of the pre-sapiens higher primates were big-game hunters; (3) that certain primates' tool-making activity and use of fire are sufficient evidence of their human intellects; and (4) that any of the pre-sapiens primates had speech and abstract thinking. All of this adds up to his denial that man descends directly from the ape.

Between ape and man Porshnev places a whole zoological family of higher bipedal primates: the Troglodytidae. In his view, instead of primitive man and developing man there was an extremely developed animal, an animal of the highest possible order, which at a certain point of evolution became man — Homo sapiens, the only species of man in existence. We don't know what will become of man in the future, but so far he is the only model of this type of "production."

To illustrate this phylogenetic point with an example from ontogenesis, let us note that there is no such thing as a primitive butterfly. It's either a butterfly, or a pupa, or a caterpillar, yet these vastly different things are intimately connected by their origin.

Borrowing a simile from a more topical realm of present-day reality, we could also liken the origin of man to a space shot. It was a multistage rocket of evolution that put humans into orbit, and the rocket went faster and faster, but no matter how high the stages got it was only those of our ancestors who

were actually in orbit who can be called human beings, according to the Porshnev theory.

True, in the final phases of their steeply rising evolutionary curve the animals become very strange and unusual and deserve a place of their own in biology and philosophy. The old Aristotelian problems of the actual and the potential of these borderline cases are somewhat similar to those confronting the biologist in some fungi which "behave" sometimes as animals and sometimes as plants or in viruses which display characteristics of both animate and inanimate objects or those facing the physicist studying "liquid crystals." Yet, according to Porshnev, on the basis of what we know at present, our unusual creatures in their usual state have to be classed beyond the pale of man. Compared with such common beings as, say, cats and dogs, anthropoids are very strange animals indeed, more manlike than doglike. And even compared with apes, Porshnev's troglodytes are very unusual animals, more manlike than apelike. But this still doesn't make them men.

Nobody ever raises an eyebrow over the fact that such different things as, say, the amoeba and the gorilla belong in the same world and are called by the name "animal." If the animal world encompasses things as different as this, how can we know where it should end? Why couldn't Nature have created animals even more developed than apes? Who has proved that the anthropoid is the last word of zoological evolution? Who can say to Nature. "Here and no more. This is the limit of thy power?"

In fact, there must be a limit to the animal kingdom and a boundary between man and beast, but is it not reasonable to assume that life moves on to a new stage of creativity only after it has fully displayed its in the old one?

What about tool making and the use of fire by our primate ancestors? Doesn't this prove beyond all doubt their human intelligence? Well, do the beaver's dams or the squirrel's storing of food for a "rainy day" signify their human intelligence? Extrapolation in biology from similar effects to similar causes is very risky. Similar functions may and do appear at very dissimilar levels of biological organization.

We agree that Porshnev's theory sounds very strange at first hearing.

Still, persists the critic, there is no phylogenetic connection between the squirrel's or the beaver's activity, on the one hand, and man's activity, on the other, while there is every reason to believe that H. sapiens inherited tool making from his pre-sapiens ancestors. Doesn't this show that the squirrel-and-beaver arguments are irrelevant? Not quite. To make the point clearer, let us take a function man shares with animals and inherited directly from them, sexual reproduction. Can we infer from the obvious similarity of this function in man and animal their similar intelligence? Is it not more reasonable to assume that an animal engaged in propagation doesn't really know what it is doing? This example shows that even in phylogeny a function can first be devoid of sense and later acquire it.

We agree that Porshnev's theory sounds very strange at first hearing. How did he arrive at such unorthodox ideas, and is there more justification for them?

Boris Porshnev was a man of encyclopedic erudition and interests. Besides his main subjects of history

and philosophy, he actively worked in and published papers on psychology, sociology, and archaeology. Taking part in archaeological and paleontological expeditions, he not only looked for facts but also searched out threads of logic to connect them. This is normal practice for the theoretician and has nothing to do with bias. The mere empiricist can't see the woods for the trees, whereas the creative theoretician soars on high and takes a bird's-eye view of the forest of facts below.

History and philosophy taught Porshnev to look for trends and tendencies in processes of historic dimensions. They also taught him to take account of the immense diversity of causes and effects and their interactions in evolution, thus whetting his interest in problems of ecology. Here he had a worth forerunner, Academicician Pyotr Sushkin (1868-1928), also a scholar of diverse interests and great erudition. In an article published in 1928, Sushkin stressed the necessity to take ecology into account in solving the problem of man's origin: "I . . . strive to see emerging man not in isolation but as an element of certain fauna which is part of the environment and its changes."

Ecology combines the concreteness of the natural sciences with the broad outlook of philosophy; in fact in its broadmindedness ecology is second only to genuine philosophy, and therefore it was not by chance that Porshnev found an ecological approach to the problem of man's origin most appropriate.

To be exact, Porshnev applied the ecological approach not to the study of the origin of man per se (in his classification), but to the origin and development of that zoological stage of evolution which directly precedes man and paves the way for his emergence, i.e. the origin and development of the Troglodytidae. Let us briefly trace his train of thought, sometimes expanding upon what he left in parentheses and making explicit what he implied.

Fact: abundance of splintered animal bones found in association with hominid (Troglodytidae) fossils. Orthodox interpretation: hominids were hunters, killing various animals (including some very big ones), eating their flesh, and crushing their bones for marrow. Porshnev's interpretation: early Troglodytidae were "bone hunters," collecting the leavings of predators' feasts. As is known, carnivores with their stomachs full are no threat even to the meekest of animals. Besides, Troglodytidae stole bones in broad daylight, while predators are most active and dangerous at night.

When the anthropoid ape found himself on the ground and in the savanna as a result of ecological changes in the Tertiary period, he suffered a decrease in food supply from what he had enjoyed in the forest; hence his search for dietary substitutes. Because of his morphology, he could not consume grass the way herbivores do, nor could he feed on herbivores the way carnivores do. But he had hands formed in the forest, and it didn't take him long to put this biological preadaptation to good use. Abundant bones, especially skulls, of savanna-dwelling animals were like shells and nuts which the ape knew how to crush with stones. The only problem was to bring bones and stones together.

Thus bone carrying and -crushing was the main factor of selection, which made the anthropoid ape bipedal and marked the beginning of the Troglodytidae as such. In this respect, Porshnev's theory closely coincides with Hewes's (1961) food-transport hypothesis, the only difference being that the former suggests scavenged bones as the objects carried by would-be bipedal primates while the latter suggested scavenged meat. Writes Hewes (1961:687): "DuBrul (1958:90) notes that upright posture is

essentially a 'reduction of the repetition of structures serving the same function,' with the forelimbs becoming 'as it were, accessory mandibles rather than locomotor devices.' leading to a 'new mode of feeding and feeding niche.'"

Indeed, the troglodyte's hands became mighty accessory mandibles, with ever-replaceable teeth of stone, which could crush bones of such strength and in such numbers as were beyond the power of all other scavengers, including the hyenas. This bone-cracking, brain- and marrow-eating stage in the evolution of the Troglodytidae, which we may call a stage of cerebro-and-myelophagia, must have lasted at least a couple of million years.

As a result of this million-year-long process, the ground-dwelling primates not only became bipedal, but also got the knack of using stones to provide for their livelihood. A million-year-long application of stones to skeletons taught the troglodytes that stones were good not only for cracking bones, but also for cutting and mincing meat that remained on some bones they collected. They also learned in the process that only sharp stones, appearing as a by-product of bone smashing. Are good for meat cutting. Thus the next and most important phase in the process was their hunting for skeletal remains with ever more meat on the bones and eventually for whole carcasses, on one hand, and their systematic making of sharp stones, on the other. Such a reconstruction of events makes comprehensible how bipedal primates came to apply hard objects (stones) to soft material (meat), which otherwise seems a stroke of genius.

Another, and ultimately the most important, "by-product" of the process was the unusually swiftly growing brain of our bipedal scavengers. What were the causes of natural selection of the brainiest in this case? The answer is probably provided by realization that the troglodyte had not one but several demanding tasks on his mind during each feeding cycle: (1) to watch the herbivores, (2) to watch the carnivores, (3) to look for results of their interaction, (4) to be in the right place at the right time to find an adequate carrion supply, (5) to outfox and outmaneuver carnivore enemies and competitors in getting away with it, and (6) to solve the problem of consumption with the ever present handicap of inadequate teeth through finding and later fashioning "artificial teeth."

Thus the Troglodytidae became the brainiest creatures on earth prior to H. sapiens. For our theme, however, it is important to emphasize that in the broad context of evolution their intelligence was the result and not the cause of their way of life. And, according to Porshnev, their intelligence was still of an animal kind, still insufficient to classify them as humans.

What about fire? Isn't its use a clear and indisputable proof of the user's human status? No, it isn't, said Porshnev, the first scholar to utter such heresy. According to him, the use of fire was no invention by a pre-sapiens genius, but a natural and inevitable consequence of stone-tool production — a by-product again, if you wish. If bipedalism was the consequence of carrying and cracking bones, then the use of fire was the consequence of fashioning stones. Red-hot splinters produced by hammering one piece of flint with another were bound to make smoldering a common occurrence at the litter-strewn sites of our bipedal primate ancestors. Porshnev thought that for an unknown length of time troglodytes were a sort of firemen extinguishing the nasty patches of smoldering with their broad hands and feet. By and by they got used to this nuisance and learned to turn it into flames and keep it going. If man can teach an anthropoid ape to smoke cigars and drive an automobile, then Nature, the greatest instructor of all,

could have taught bipedal hominoids some tricky things too. Thus, according to Porshnev's logic, it seems not so much that bipedal primates adapted fire as they became adapted to it.

To sum up, the Troglodytidae's making of tools and use of fire were more the result of their ecology than of their psychology, whereas with H. sapiens it was the other way around. This needs to be stated to show not only Porshnev's understanding of the events preceding the appearance of H. sapiens, but also his idea of the subsequent divergence of man and the Troglodytidae. Since the tool-making activity of the Troglodytidae was mainly stimulated by ecology, they were bound to lose it with a sufficient change in the environment. And, conversely, since such activity of H. sapiens was deeply rooted in his intelligence, he went on developing it despite the environment. Thus the troglodytes and H. sapiens headed in opposite directions: the first slipped back to the tool-less and fire-less life of other animals; the second marched on to ever new vistas of technological innovation.

Now we come to the crucial question of the whole theory: How and why did H. sapiens come into being? According to Porshnev, the appearance of H. sapiens is connected with the formation in the brain of the second signal system (Ivan Pavlov's term), which makes speech and conceptual thought possible. The second signal system emerged, Porshnev thought, not as a result of the primates' work with any inanimate object (such as stone tools, for example), but as a result of their inter-group relations, of activities directed at each other. The suggested mechanism of such interaction is described in detail by him in a work which is due to be published posthumously in a few months.

Certainly, Porshnev was not the first thinker to believe that the power of speech is the true mark of man, but he was the first to think it appeared so suddenly and so late in anthropogenesis. The event can be compared to an atom bomb explosion. Just as a critical mass of uranium is needed to produce such an explosion, so a certain critical amount of brain of a certain complexity is required to make speech and abstract thinking possible. Therefore Porshnev denied the possibility of any rudimentary, inarticulate and primitive speech prior to this postulated "verbal explosion."

To test this heretical theory, we have to find out whether Neanderthals have the power of speech or not. We'll say more on this issue below, but, assuming for the moment that Porshnev is right and all the pre-sapiens primates were truly devoid of language, what status — human or animal — are we going to grant to Neanderthals? For our part, we'd rather accept a species or genus of tool-making and fire-using animals than a species or genus of speechless humans.

Poirier asks what is meant by "the present crisis in current ideas on the evolution of the higher primates." As we understand it, the crisis is evident from the following:

1. The more facts are obtained (to wit, the Leakeys' discoveries), the less clear the overall picture of man's origin becomes from the viewpoint of the orthodox version.

2. The more fossil forms are found, the more insistent becomes the unspoken question of what made the whole stage of primate evolution between the apes and H. sapiens so promptly extinct. While paleontologists hotly debate the question "What did in the dinosaurs?", paleoprimatologists keep silence about the immeasurably more relevant question of higher-primate extinction.

3. Orthodox primatology has not recognized and apparently has no clues for analyzing the evidence of the continued existence on earth of higher primate forms distinct from both the Pongidae and H. sapiens. Such a turn of events is completely inconsistent with the orthodox version and therefore is quietly ignored.

What is the "mutually independent evidence that has made it possible to establish the existence of this relict species?" A detailed answer is provided in Porshnev's (1968b) work "Borba Za Troglodytov" (The Struggle for Troglodytes), which is now available in a French translation (Heuvelmans and Porshnev 1974).

Here we list the categories of independent evidence as the matter stands:

1. Mention, description, and/or drawings of what Porshnev, following Linnaeus, calls troglodytes (or relict hominoids; i.e. higher bipedal primates different from H. sapiens) in accounts of ancient or medieval travelers, in natural-history books, medical books, etc.

2. Mention or description in ancient or medieval poetry, art, folklore, demonology.

3. Sightings by modern outdoorsmen.

4. Photographs and plaster casts of footprints.

5. The Patterson film, which at last makes the creature's photographic appearance and movements available to everybody's eyes.

As an example of the first category, we can cite Nizami al-Arudi, who says in his Chahar magal (c. 1150-60, quoted in Bernheimer 1952:190): "The highest animal is the Nasnas, a creature inhabiting the plains of Turkistan, of erect carriage and vertical stature, with wide, flat nails . . . This, after mankind, is the highest of animals, in as much as in several respects it resembles man: first in its erect stature, secondly in the breadth of its nails, and third in the hair on its head." Also in this category is the fact, strangely overlooked, that modern anthropology bears in its very heart an indirect mark of the of the troglodytes. It is generally believed that the central term of modern anthropology — H. sapiens — was coined to distinguish modern man from the fossil record. Nothing of the sort. The term was introduced by Linnaeus in the 18th century, 100 years before the Darwin theory and systematic studies of hominid fossils. Linnaeus had information about the existence of another kind of "man," hairy, mute, non-sapient, and for the sake of contrast with it he designated our species "sapiens."

Examples of categories 2 and 3 are legion. As for categories 4 and 5, we have studied the photographs and plaster casts of footprints ascribed to relict hominoids, on the one hand, and the Patterson film (made available to us by René Dahinden, to whom we express our gratitude), on the other. In the latter examination, biomechanicist Dr. Dmitri Donskoy also took part, supplementing our analysis with his

conclusions (Hunter and Dahinden 1973:189-92). We have established five solid correlations between the footprints and the creature seen walking in the Patterson film, all five distinct from or totally nonexistent in sapiens characteristics. This leaves no doubt in our minds whatsoever that both the film and the footprints we studied are genuine.

Poirier wonders about the "planned acquisition of a specimen, living or dead," of the so-called relic Paleanthropus. According to the theory expounded here, man is a unique offspring of a unique family. One potent proof of man's unsurpassed originality is the fact that he decided and managed to reach the moon prior to meeting and officially recognizing his unique animal cousins on earth. As to the whys and how of this fantastic situation, see Green (1968, 1970, 1973), Hunter and Dahinden (1973), Heuvelmans and Porshnev (1974), Krantz (1971, 1972), and Sanderson (1961).

What is "negative adaptiveness"? By this term Porshnev meant that after H. sapiens and the troglodytes had diverged and the former got the upper hand, the latter had to adapt themselves to the conditions and environments the former found negative. For example, H. sapiens prefers daylight; troglodytes had to be active at night (hence Linnaeus [1758] defines H. sapiens as "diurnal" and H. troglodytes as "nocturnus"). Again, H. sapiens prefers fertile plains; troglodytes had to settle in high mountains, deserts, dense forests, and swamps.

Malik argues that "the concept of automatic imitation of implements makes our ideas about cultural tradition and change absurd." This is argumentum ad hominem, and as such no use in science. Many things in science first seemed right, then absurd, and vice versa. Porshnev objected to the application of the term "cultural" or "cultural tradition" to pre-sapiens forms, but he never denied change in their tools or tool making. If these forms themselves changed morphologically, why shouldn't their "exosomatic organs" have changed? Porshnev also argued that these "ethological organs" could change somewhat faster than the morphology of their owners. From the viewpoint of Porshnev's theory, the right use of the term "culture" is seen from the following example: Dances of H. sapiens are an element of culture and are studied by ethnography; dances of the chimpanzee are an element of zoology and are studied by ethnology.

In response to Raemsch: As is known, size alone cannot be the criterion of a brain's function: both size and structure should be taken into account. Though equal to the sapiens in brain size, the Neanderthal brain is different from it, especially in its underdeveloped frontal lobes. (This is apparent from a look at a Neanderthal frontal bone.)

Among other considerations, Porshnev based his belief that Neanderthals were speechless on the study of their morphology, on the one hand, and on the data of sapiens brain pathology resulting in aphasia, on the other. He also mentioned the following consideration: no drawings of any identifiable objects made by Neanderthals are known to science. As far as we know, such drawings appear only with the advent of H. sapiens. A drawing is a definite sign of abstraction, just as words of a language are. Therefore, the absence of Neanderthal fine art indicates indirectly an absence of language.

That the emergence of language in anthropogenesis was rather sudden seems probable from the following: Though man's physical tools at present include everything from stone axes to earth satellites,

we don't find any comparable gradation in his mental tools, i.e. languages. "Nowhere in the world has there been discovered a language that can validly and meaningfully be called 'primitive'" (Hockett 1960:89).

Raemsch holds that "we cannot now examine the neuro-anatomical structures for speech in Neanderthal man."

Let us answer by quoting from a newspaper account sent to us by our Canadian colleague René Dahinden (Agnew 1971):

The vocal tract of Neanderthal man — who lived some 40,000 to 70,000 years ago — lacked most of the pharynx and was capable of producing only "inefficient and monkey-like sounds, according to researchers from Yale and the University of Connecticut.

They undertook studies of the vocal system of Neanderthal man for the National Institute of Dental research after noticing that some mongoloid children who do not talk have heads with an infantile shape. Incidentally, Neanderthal skulls have similar shapes, they found. ...

The researchers also found that Neanderthal man had a voice box high in the throat — a condition present in apes, monkeys and human infants — that made it possible for him to breathe and swallow simultaneously without choking.

This capability is lost in the modern adult human when his vocal tract becomes a sophisticated structure linking larynx, pharynx and mouth with complex neurological controls.

The researchers suggested that Neanderthal Man may have disappeared because of his speech deficiency. ...

"We may speculate on the disappearance of Neanderthal Man, and we can note that his successors — for example, Cro-Magnon Man — had the skeletal structure that is typical of man's speech mechanism," they added.

"Neanderthal Man's disappearance may have been a consequence of his linguistic — hence, intellectual — deficiencies. ... in short, we can conclude that man is human because he can say so."

We hasten to add that in Porshnev's opinion Neanderthal's muteness accounts for his disappearance from the tool-making record only; he never disappeared from life itself. If Porshnev is right, we should still have a chance to examine the neuroanatomical structures for speech (or lack of it) in Neanderthals in vivo.

We share Blumenberg's warm feelings for the chimpanzee, and we love other animals that vocalize even less than chimpanzees. What if the baboon could learn the equivalent of 50 or 25 words in the use of

plastic objects? Should he be "sunk into the genus Homo" too?

We think that to compare man and animal in terms of their communication abilities we should first of all examine their natural communication systems and not such artificial things as Yerkish. There are many points on which man's speech and the communication systems of animals coincide, but there are others on which they are as far apart as heaven and earth. By the communication means at their disposal, animals can greet, warn, threaten, frighten, order, tease, invite, entice, deceive, ask for, beg, give consent, and show indifference, surprise, bewilderment, respect, contempt, contentment. A bee though her dances can indicate to her sisters the direction and distance to nectar-laden flowers, which the instructed bees don't fail to find. Thus both animals and humans do use symbols to influence their counterparts' behavior in their respective kingdoms. But what animals can't do, what is the sole prerogative of man, is to engage in a symbolic give-and-take, which we happen to be performing right now, and which is called discussion. Animals can "argue" with paws and claws, but not with symbols. To be fair to the chimpanzee, we must at least ask his opinion before plunging him into our excessively vocal genus. If Blumenburg can produce a chimp that can argue the point, be it in Yerkish and within 100 words, we will probably capitulate.

In reply to Aquirre: Porshnev mostly referred to points and practices of taxonomy accepted by the majority of Soviet anthropologists at the time of the writing of his article. As for his estimate of the number of generations, he didn't mean that the whole of the Lowe Paleolithic lasted 1,000 generations, but only that it took about 1,000 generations for stone tools to change slightly in the Lower Paleolithic and 200 generations for slight changes in the Middle Paleolithic.

Touching on the problem of continuity in evolutionary and historical processes, we can say that Porshnev proceeded from the thesis that in evolution and history slow processes of quantitative change alternate with sudden and stormy processes of qualitative change — in other words, that there is no evolution without revolution.

Aguirre says, "Let us look for a specimen, alive or dead, of an infra-man, but let us not classify it before we find it." Well, you can't even start looking for something before you have some idea what you are looking for. It was precisely the development of such ideas on the issue that led Porshnev to the taxonomy described in the article under discussion, which can be helpful both for the mounting and conduct of the search.

As for the possible racists connotations referred to by Aguirre, it was Porshnev's opinion that, on the contrary, current recognition of lower and higher forms of humanity, such as H. erectus, H. neanderthalensis, and H. sapiens, constitutes a potential basis for racism. Porshnev's insistence that there is and has always been just one species of humans — H. sapiens — leaves no room for racism even in prehistory.

In conclusion, we want to thank all the participants in the discussion and hope that they will read Porshnev's article once again to see the depth and breadth of his theory.

References Cited

Agnew Patricia. 1971. Early man unable to talk properly. Toronto Sun, July 24.

Aguirre, E. 1966. "Las primeras huellas de lo humano," in La evolución. Edited by M. Crusafont, B. Melendez, and E. Aguirre, pp. 617-75. Madrid: B.A.C.

Bernheimer, Richard. 1952. Wildmen in the Middle Ages. Cambridge: Harvard University Press.

Bunak, V. V. 1966 "Speech and intellect, stages of their development in anthropogenesis (in Russian)," in Iskopaemye Hominidy I Proiskhozdenie Cheloveka. Moscow: Nauka.

Day, M. H. 1969. Omo human skeletal remains. Nature 222:1135-38.

Green, John. 1968. On the track of the Sasquatch. Agassiz: Cheam.

------, 1970. Year of the Sasquatch. Agasiz: Cheam.

------, 1973. The Sasquatch file. Agassiz: Cheam.

Heuvelmans, Bernard, and Boris Porshnev. 1974. L'homme de Néanderthal est toujours vivant. Paris: Plon.

Hewes, Gordon W. 1961. Food transport and the origin of hominid bipedalism. American Anthropologist 63:687.

Hockett, Charles F. 1960. The origin of speech. Scientific American, September, p. 89.

Hunter, Don, with René Dahinden. 1973. Sasquatch. Toronto: McClelland and Stewart.

Kochetkova, V. I. 1970. On brain size and behaviour in early man. Current Anthropology 11:176.

Krantz, Grover S. 1971. Sasquatch handprints. Northwest Anthropological Research Notes 5:145-51.

-------, 1972. Anatomy of the Sasquatch foot. Northwest Anthropological Research Notes 6:91-104.

Larsell, Olof. 1952. 2d edition. Anatomy of the nervous system. New York: Appleton-Century-Crofts.

Linnaei, Caroli. 1758. 10th edition. Systema naturae.

Porshnev, B. F. 1963. The present state of the problem of relic hominoids (in Russian). Moscow: Viniti.

----------, 1966a. Do we face a revolution in primatology (in Russian)? Voprosy Filosofii 3: 108-19.

----------, 1966b. L'origine de l'homme et les Hominoides velus. Revue Internationale de Sociologie, ser. 2, 2(3):76-83.

----------, 1968a. "Les aspects anthropogénétiques de la physiologie de l'activité nerveuse supérieure et de la psychologie." Proceedings, VIIIth International Congress of Anthropological and Ethnological Sciences, Tokyo, vol. 1.

----------, 1968b. The struggle for troglodytes (in Russian). Prosior 4:98-112, 5:76-101, 6:108-21, 7: 109-27.

----------, 1969. The problem of relic Paleanthropus (in Russian). Sovetskaya Etnografia 2: 115-30.

----------, 1971. Second signal system as a diagnostic line of distinction between the Hominidae and the Troglodytidae (in Russian). Doklady Akademii Nauk SSSR 198(1):228-31.

Premack, A J. and D. Premack. 1972. Teaching language to an ape. Scientific American 227:92-99.

Rumbaugh, D. M., T. V. Gill and E. C. Glaserfield. 1973. Reading and sentence completion by a chimpanzee (Pan). Science 182:73133.

Sanderson, Ivan T. 1961. Abominable snowmen: Legend come to life. Philadelphia: Chilton.

Shevchenko, Yu. G. 1971. Evolution of the cortex of the brain in primates and man (in Russian). Moscow: Moscow University Press.

Thoma, A. 1966. L'occipital de l'Homme Mindélien de Vértesszol-los. L'Anthropologie 70:495-534.