

Age of proto-human

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Abstract

The paper intends to find the more probable age of proto-human, which in turn could help in finding the timeline of proto-language. In the hominid line of evolution, the rise of modern humans plays a significant role and its role is also owing to the fact of their uniqueness due to language. Different disciplines are put together to solve the mystery of language of human. In an attempt to understand how old, language could be, the paper makes an attempt to find it by first locating the timeline of the proto-human, using the Minimalist program of Chomsky. The search goes with Cartesian discontinuity notion and uses paleoanthropology and genetics to find the age of proto-human.

Introduction

The debate of how old a proto-human is or to inquire about how old proto-language is, would need an interdisciplinary crossbreeding of different disciplines to go for its search. This paper makes an attempt to zoom to the search through paleoanthropology and genetics by going through time scale of human evolution. A proto-human is considered to be an immediate predecessor of AMH

(Anatomically Modern Human) , which is considered to have started existing in the time nearing to Middle-Late Pleistocene boundary or 0.2mya to 0.1mya (mya = million year ago). AMH is what today called as modern human.

The language which was initiated by proto-human is called proto-language and this language is considered to be the mother of all languages , indeed , the originator of articulated modern human language. The task of finding how old the proto-human could also lead to solve the problem of finding how old the proto-language is, hence, there is a necessity to make a possibility of determining the age of the proto-language by trying to zoom down and narrow the range of the period in which the proto-human might have existed and this narrowing of the range of the period is a cumbersome task which is going to be discussed in this paper.

The issue of proto-language is significant owing to the fact that the proto-language which is considered to have allowed recursion to take place , while the formal articulation in the form of speech for language has not yet taken place, plays an important role in understanding the origin of human language. The very fundamental issue of language circles around the debate of finding out more closely with focus that what essentially language is and is not meant for communication which is commonly thought, can be understood from the notion of Chomsky's Minimalist program of language which is based on recursion in language. Because of recursion, human language is possible and because of recursion, human is unique and hence, the discontinuity thesis continues which goes against the Darwinism continuity thesis. This discontinuity is also a sign of Cartesian dualism which is to be applied here in the form of Cartesian discontinuity. The very fact that recursion has made human language possible, also compels to think how old has the process of such recursion to kick start language started, thereby asking , how old is the first ever immediate ancestor of human's language which is called proto-language, here. The retrospective study of the timeline of human evolution also brings an important step to find and locate the most

probable period of the proto-human which is indeed an extant species which is hypothetical in making here, so that, the research is possible to go ahead. In the process of doing so, there will be an application from the discipline of paleoanthropology and genetics, though, there are many areas through which , the study could also be done, but in this paper, majorly , the discussion is backed by the two disciplines mentioned above besides trying to make it scientifically sensible to work its results with biolinguistics.

Approach from Paleoanthropology

Paleoanthropology which is the study of paleontology and physical anthropology to research on human evolution through fossils, can not be considered to be not playing a significant role in finding the location of time period of proto-human. Yet, fossil evidences don't sufficiently prove the existence of a species and could determine its time scale , but fossils do play vital role through carbon dating and DNA sequencing , to find out how old the fossil could be and from that, the calculation of the least nearest time scale could be calculated. The calculation is bound to be present with some error percentage and the range of error percentage can be reduced in the next findings with more precision. The problem is how precisely and closely , one can go to find out the age from the given fossil and whether, how far can the fossil evidences impact in the finding of the age of the extant species which is under discussion here , i.e. proto-human, is the point of discussion. Since proto-human is a fictitious extant species which is a missing link between the ancestors in homo species and homo sapiens sapiens, the fossil evidences for the proto-human is not possible but nevertheless, by studying the available fossils of those species which come before the time line of the proto-human and the timeline of the homo sapiens sapiens , one could narrow down the range of the timeline so that, the location of the presence of the proto-human could become more meaningful using thought experiment .

Paleoanthropology

The discussion of the timeline in this paper is to narrow down the timeline but before doing that, there is a fundamental need of knowing from where the possibility of timeline of hominid could start. The period of Middle Pleistocene which goes from 780,000 ya to 125,000 ya (ya = years ago, mya = million years ago) is the major timeline of discussion here. The period of Pleistocene is also marked by glaciations climatic condition in which the temperature drops down and also goes up in interglacial periods. During this time, many hominids expand and spread out in the Old World of Africa, Europe and Asia.

Pleistocene period can be divided into three sub periods namely ,

- (i) Early Pleistocene
- (ii) Middle Pleistocene
- (iii) Late Pleistocene

(i) Early Pleistocene :

Early Pleistocene ranges from 1,800,000 ya to 780,000 ya, and is characterized by early glaciations period of climatic conditions. It belongs to pre- Lower Paleolithic and Oldowan cultural period. In the early part of this period, Early Homo and Australopiths existed and in the latter part of the period, Homo Erectus came spreading to the next period of Pleistocene i .e. Middle Pleistocene.

(ii) Middle Pleistocene :

Middle Pleistocene ranges from 780,000 ya to 125,000 ya in which the extension of early glaciations period of climatic conditions takes place. It belongs to Lower Paleolithic and Acheulian cultural period. In terms of Hominidae presence, the early part of this period had the extension of Homo erectus from the Early Pleistocene, and in the latter part of this period, it had Pre-Modern Sapiens and Homo Heidelbergensis, though their presence extended to the early part of the next period of Pleistocene i .e. Late Pleistocene.

(iii) Late Pleistocene :

Late Pleistocene is divided into sub-periods due to the availability of so many resources of information as the period is relatively younger compared to the rest two previous periods which have been discussed.

This period is studied under the following sub-periods determined by the range of the years given below.

(a) 125,000ya to 100,000ya :

It is the early part of the Late Pleistocene period in which an early part of the Last Interglacial period of climatic conditions occurs. It is characterized by early part of Middle Paleolithic and early part of Mousterian cultural period. The presence of Pre-Modern Sapiens and Homo Heidelbergensis existed in this sub-period.

(b) 100,000ya to 75,000ya ;

It is the sub-period characterized by the latter part of Late Interglacial period with Middle Paleolithic period. In Hominidae, the rise of Modern Sapiens and Neanderthals

started while Homo Heidelbergensis and Pre-Modern Sapiens ceased to exist. It has the same Mousterian cultural period.

(c) 75,000ya to 40,000ya :

It is the sub-period which is characterized by the early part of Last Glacial period with the same Middle Paleolithic period and Mousterian cultural period. The uniqueness of this sub-period is the downfall of the population of Neanderthals and the increase in population and spread of the Modern Sapiens.

(d) 40,000ya to 30,000ya :

It is the sub-period which has the same Last Glacial period climatic conditions but with Upper Paleolithic period with Perigordian and Chatelperronian cultural periods. This sub-period is significant because of the fact that this time period brings the end of Neanderthals and thus, the world of hominidae rests to Modern Sapiens only.

(e) 30,000ya to 10,000ya :

It is the sub-period known for its presence of Modern Sapiens only in Hominid line. It is characterized by Last Glacial period of climatic conditions , Upper Paleolithic period and Magdalenian and Solutrean cultural periods.

The notion of showing the sub-periods of Pleistocene period along with cultural periods which are archaeological industries , plays a significant role in understanding what has happened to hominid line of Per-Modern Sapiens and other Early Homos.

The next issue is to zoom down in Pleistocene period and for this , the study can be done by taking the timeline from 2,000,000ya to 100,000ya or 2mya to 0.1mya, which is given below.

(a) 2mya :

It is the period which is considered that Early Homo has started to exist. There could be a possibility of having more than a species branched out from Early Homo.

(b) 1.5my to 1mya :

It is the period when Homo Erectus started to exist.

(c) 0.5mya :

It is the period when Early Homo Heidelbergensis existed.

(d) 0.25mya :

It is the period when Later Homo Heidelbergensis came.

(e) 0.25mya to 0.1mya :

It is the period when the split has already occurred in the hominid line , thereby differentiating between Neanderthals and AMH (Anatomically Modern Humans) .

In terms of phylogeny of genus Homo with diversity of its species, it could be projected that Homo Ergaster is the common ancestor of Homo Erectus and Homo Antecessor which in turn splits to Homo Heidelbergensis . The period of Homo Heidelbergensis is considered to have given rise to the development of Homo Neanderthals and Homo Sapiens, but the missing link of their common ancestor which could be probable, is called as Homo Helmei. Whether Homo Helmei is the common ancestor of Homo Neanderthals and Homo Sapiens is still debated.

The debate starts from here, whether there could be a possibility of having a common ancestor of both Homo Neanderthals and Homo Sapiens , considering the fact both are so close compared to other homo species in hominid line, though there are also differences among them. The similarity between the two is considered substantial when compared with other homo species. Before going into the debate whether there could be a possibility of having a probable common ancestor of Homo Neanderthals and Homo Sapiens, it would be better to understand their differences too, despite both appearing to be similar but not same. Despite showing their differences in tools technology , hunting , stone material transportation , art and burial , there is also a difference in terms of their genetic make up and brain size. The brain size of Homo Neanderthals is larger than the brain size of Homo Sapiens , which tends to suggest that Neanderthals are supposedly to be more intelligent and have more cognitive skills than those of Homo Sapiens , but it turns out that the large brain size of the Neanderthals is to have more efficiency in producing heat in their metabolic reactions in their body so that they could survive in cold climate of glacial period, and hence, the larger size in brain could not dominate over Homo Sapiens. In fact, the human beings or modern humans who are Eskimos have bigger brain size than the size of the brain of the normal modern humans living in a normal climatic condition, so that the efficiency of the body metabolic reactions takes place to produce heat effectively for Eskimos to survive in cold climatic conditions. Thus, the difference between Homo Neanderthals and Homo Sapiens brings up a further issue , that how could , both which are so different have a common ancestor , or whether such possibility could ever be thought of or not .

The debate here is to argue whether the common ancestor could be possible or not, and by doing so, the search for the immediate predecessor to AMH or modern human could probably be nearer to find. Whether the search for the proto-human which is the immediate predecessor of AMH will be scientifically verifiable or not, is the question left for the future science to decide , or whether even the

future science could discover so is again the problem, because of which, there is a need for thought experiment to argue for the proto-human philosophically.

The argument is , if Homo Helmei is considered to be the same ancestor of Homo Neanderthals and Homo Sapiens , then, the proto-human could be some species linking between Homo Helmei and Homo Sapiens and which has not become Homo Neanderthals. And , probably, there could be also an equivalent of proto-human to Homo Neanderthals, and if it is called proto-Neanderthals, then , whether it would be feasible to conclude that both proto-human and proto-Neanderthals come from the same Homo Helmei with a division which has occurred to distinguish between proto-human and proto-Neanderthals, thereby dividing the two hominid species line in such a way that Homo Sapiens and Homo Neanderthals become so different and distinct.

The problem is also further aggravated if the proposition of Homo Helmei to be the common ancestor of both Homo Sapiens and Homo Neanderthals, is false, then ,it could also be further argued that there could be a common ancestor but much older than Homo Helmei but younger than Homo Heidelbergensis and obviously younger than Homo Ergaster. But , what then is the problem in making the range of the timeline so big ? The problem is, the search for proto-human will become more meaningless if an attempt is made to search for it in 1.5mya or 1mya when Homo Ergaster and Homo Heidelbergensis exists, because by definition constructed for proto-human, the species which of interest in our search should be as close as to the timeline in which the AMH exists and that happens in 0.25mya and 0.1mya and this is the period which is much recent (from now) compared to the period pertaining to the existence of Homo Ergaster and Homo Heidelbergensis.

The problem could also be looked differently by proposing that Homo Heidelbergensis becomes the common ancestor of proto-humans and Homo Helmei in which Homo Helmei did not divide

the hominid line into Homo Sapiens, but instead, it goes to evolve to Homo Neanderthals, while proto-humans evolve to Homo Sapiens due to some causes giving rise to discontinuity thesis which is against the Darwinism continuity line of evolution. But, this could create more problems than finding a nearer solution to trace the location on the timeline of the existence of proto-human, as proposing proto-human could have existed in 0.5mya and 0.25mya i.e. between the timeline of Homo Heidelbergensis and Homo Helmei would be more complex and demanding.

The another alternative could be, Homo Helmei when struck by some causes whether genetic mutations or some impactful causes internally or externally, has transformed into a more complex species called Homo Sapiens, while the remaining Homo Helmei which could not be struck by sudden deep causes, remain to roam around as Homo Neanderthals, but this argument is again more problematic, as Homo Neanderthals can not be so similar to Homo Helmei, and if it is so, then, why Homo Sapiens should be singled out to be merely distinct from Homo Helmei, while Homo Neanderthals has shown more similarity with Homo Helmei in this construction. Hence, this alternative is also problematic.

The another probable argument could be that, the common ancestor of both Homo Neanderthals and Homo Sapiens is proto-human, but since it is also an immediate predecessor to Homo Neanderthals, it could also be named as proto-Neanderthals as, both proto-human and proto-Neanderthals in this construction refer to the same extant species, and this extant species when struck by some causes whether genetically or externally, become Homo Sapiens in next hominid line, while those which have been not stricken remain as Homo Neanderthals. But, if this construction is accepted, then, proto-human or proto-Neanderthal which refer to the same extant species, has to be Homo Neanderthals, otherwise, how could those which have not been stricken remain as Homo Neanderthals, unless they were already Homo Neanderthals, hence, this argument too seems to be going circular, but, the alternatives suggested so far signify the complexity of placing and locating proto-human.

So, considering the alternatives in the construction of locating the timeline of proto-human, it could be taken that the proto-human existed before Homo Sapiens and proto-human is not proto-Neanderthal which means, that proto- human and proto-Neanderthal (if proto-Neanderthal is granted here) are unique and distinct to each other and both if considered to have the common ancestor ,say, Homo Helmei, then, such construction would not be hugely problematic, but the verification has to wait for the future science to tell. The further scientific question which comes logically is, why there should have been a division of Homo Helmei to two different hominid lines leading to Homo Sapiens and Homo Neanderthals via proto-human and proto-Neanderthal respectively. Whether the division occurred from the common ancestry of Homo Helmei, is for the future science to decide. But , nevertheless , to say, that proto-human existed before Homo Sapiens and it was different from that which comes prior to Homo Neanderthals and which is also different from other hominids ,it would also be more scientific to narrow down the location of the timeline by taking help from genetics besides what has already been done from paleoanthropological investigations and thought experiment so far.

Approach from Genetics

The question of locating proto-human in timeline of hominid evolution has become complex and in order to make it solvable to approach the nearer timeline, the application of genetics is inevitable . The timing of proto-human will enable the search to find for the timing of proto-language which is the need to understand language of human or AMH. In the making of modern humans, it could be possible that around 0.2mya , there could be genetic mutations which led to the coalescing of mtDNA haplotypes in a living predecessor to AMH. That living predecessor could be the source of proto-human or it itself could be the proto-human, could be discussed using genetic explanation and findings. In the period of

0.2mya, the fossils of hominids found are different from those of hominids living before that timeline. The importance of mtDNA (mitochondrial DNA) is that mtDNA haplo group helps in determining the phylogenetic tree of hominids and from the tree, there could be a scientific possibility of locating the timeline of the proto-human. In the development of genetic lineage in hominid line , the information carried by X chromosome gets affected and changed while the information carried by Y chromosome does not get hugely affected like that in X chromosome and hence, Y chromosome remains dominantly significant in terms of understanding and tracing the genetic tree using mtDNA haploid group.

Y chromosome hypothesis has led to the introduction of the notion of Mitochondrial Eve which is also the matrilineal most recent common ancestor (MRCA) from which , all the current living humans branch out genetically in phylogenetic tree. Since Y chromosome is a female chromosome and X a male chromosome , and in genetic research, it is found out that , while X chromosome can be changed , but Y chromosome can not be so easily like X chromosome , thus, the importance of matrilineal lineage genetically is more than the genetically paternal lineage or Adam's X chromosome, but the debate still persists. Nevertheless, in this paper, since the aim is to find out the timeline of the existence of the proto-human to find out its age, it would be better to first look for a bigger range of the timeline and then squeeze the timeline , and in that process, it would be fruitful to study on mtDNA and Y chromosomal genetic lineage.

The genetic mutations in DNA in hominid line could only make the sudden change in the phylogenetic line and evolutionary history of hominid. The change is also confirmed by the differences of the fossils found after the genetic mutations. The genetic mutations could have made the brain structure of the hominid to be transformed into a four lobes structured quadrilateral brain which is the brain of AMH. Such sudden changes might have occurred in the proto-human. From population genetics to calculating molecular clock or gene clock, it would need the molecular data from DNA for its nucleotide sequences

and amino acids sequence for proteins . The finding from such a gene clock, could also lead to the search for more probable timeline of the proto-human.

The problem from genetics and paleoanthropology also comes from the range of timeline given by many scientists and linguists in the study of the proto-language. Chomsky believes that before 0.1mya, there was no issue of language, but from 0.06mya and 0.05mya, the issue of language has started. If the period between 0.06mya and 0.005mya is the timeline that language has developed , then the proto-language can not come after this timeline. Going before this timeline, i.e. before 0.06mya, it would also mean that the search of finding the timeline of the proto-human ,must also be backed by the findings from paleoanthropology and genetics. Hence, the role of gene clock or molecular clock can not be ignored.

Considering the fact of the sudden genetic mutations in 0.1mya and the rise of language in 0.06mya, the range of locating proto-language is getting shrunk , and as proto-language is prior to language by definition, the initiator of the proto-language which is the proto-human has to have existed somewhere nearer the timeline of 0.06mya to 0.08mya or has to be in the timeline of 0.06mya to 0.1mya, but the point is, the manifestation of a genetic mutation takes almost 1mya sometimes to give to its morphological expression and sometime, the expression of the genetic mutation is so fast and can be done in a few years to thousands of years. The issue is, how impactful the genetic mutation was , and yet , despite being impactful, how long did it take to express. The answer lies in the future science.

Conclusion

The arguments above show that the finding of the timeline of proto-human is a complex task which requires an interdisciplinary cooperation of different disciplines, but nevertheless, in this paper, an attempt has been made to narrow down the timeline of the proto-human using the findings from paleoanthropology and genetics besides following the Minimalist Program of Chomsky. The timeline of the proto-human could be around 0.1mya to 0.06mya and preferably, it could be nearer to the region of the timeline of 0.06mya, otherwise, there could be a possibility that the proto-human existed for a period between 0.1mya and 0.06mya without having any genetic mutations. But, if the consideration that genetic mutations occurred in 0.1mya is granted, then, proto-humans might have started existing from 0.1mya, but that proto-human which becomes an immediate predecessor to AMH, might have existed somewhere nearer to the timeline of 0.06mya. But, again, the question remains, why proto-humans had to wait for such a long time from 0.1mya to 0.06mya to become AMH. The reason could be that expression of the genetic mutations might have made the proto-humans to take such a time to get transformed into humans or AMH. So, the more likely timeline of the proto-human could be 0.07mya to 0.06mya if the genetic mutations is considered to have taken around some ten thousands years to express finally in the form of bilateralization of brain into quadrant lobes of brain of AMH to explain recursion in Minimalist program of Chomsky. Hence, the proto-language could be 0.07mya old, while proto-humans could be 0.1mya old, but that very proto-human which becomes an immediate predecessor to AMH may be 0.07mya old.

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