

## African Exodus

*R.McKie, (C.Stringer)*

February 21-24, 2007

The study of prehumans is traditionally a paleontological project, depending on the chance discoveries of fossilized remains. The prospects of a given human being bequeathing his or her skeletal remains to a distant posterity are slim indeed, in addition to this populations of prehistoric humans and humanoids were thin compared to those of other animals, thus the intermittent find is made to do a lot of work. In fact the major expertise required of a student of pre-historic man is that of a dentist, as teeth are the most durable elements of a dead body. Yet one does the outmost of whatever is available, and paleontologists are notorious for their penchant for drawing the most far-reaching conclusions from scanty evidence. The questions posed are so compelling that the temptation to extend an extrapolate is very hard to resist. As a result the prevailing theories and state of affairs are subjected to rapid turnovers as new evidence turn up, overthrowing old truths for modern fashions. As the philosopher and historian Collingwood remarks, history is made out of the available evidence of the present, but of course, as he teaches, almost anything is potential evidence. The great revolution in paleontology came about in the 70's as one started to cast the net wider in search of traces of the past, in particular looking for the genetic traces of which there are plenty in present human populations. The theory of evolution in particular posits the existence of a geneological tree which encompasses not only man himself but all living things, i.e. everything that involves DNA. It is somewhat miselading to call it a tree, when viewed at its finest resolution, namely that of individuals, due to the invention of sexual reproduction. However, and this is a fundamental tenet of evolutionary theory, at the level of species, there are no cycles, once species diverge they will never reunite again, and the notion of convergent evolution can only be properly understood against this fundamental fact of divergence<sup>1</sup>. Never mind that the notion of a species is a contentious notion halfway between a simple convention, as is the division into races, and an intrinsic notion, and in particular the process of speciation is poorly understood.

Contentious or not, no one denies that humans stand out against other beings and that there is no problem of deciding who is a human or not. Viewed from within, the species of humankind is very well defined indeed. Yet this does not contradict the fact that humans display large variety of forms, although properly speaking the perceived diversity of the human family is to a large extent an artefact of our enhanced sensitivity to human difference, which in particular manifests itself in our uncanny ability to recognise faces. Our awareness of racial diversity and its ultimate conclusion - racism, is supposedly of recent origin. The author(s) claim that only through the transatlantic voyages did

---

<sup>1</sup> Convergence means that different species will show striking similarities, which are not due to fortuitous history but physical constraints. Evolution is the result of an interchange between the spontaneous creation of possibilities and the steady rejection by an unforgiving reality, the essence of Darwins insight of natural selection. Thus convergence means essentially that a given problem has a canonical solution.

humans experience discontinuities, that formerly slow inland travel presented a continuous deformation of neighbours thus never bringing up the notion of human divisions. I find this explanation somewhat contrived. More to the point is that modern racism, with its scientific claims, stems from the Enlightenment, ironically pointing out that a movement one of whose leading ideas being the eradication of religious superstition, replaced it by a pseudo-scientific one. In a more religious time, divisions among people were conceived in terms of fidels and infidels, and within each fold, humans were considered all alike in the face of God. Any cultural or social inferiority was the result of punishment, not an intrinsic deficiency. Thus it is for us moderns somewhat embarrassing to read the views on racial issues as expounded on by our intellectual heroes of the 18th and 19th century. The racial division of mankind is however deeply entrenched, and even after the worst excesses of racial biology were discarded in the aftermath of the Second World War, some profounder explanation for its existence was expected.

Darwin was at the time of his 1859 book chided on the issue of man deriving from monkeys, and were asked about the missing link. His response was predictable enough, given the scarcity and haphazardness of fossil remains, that those had simply not been found. In fact the search for missing links have been raging since the mid 19th century, starting with the accidental discovery (1856) of the ancient skull in a cave in the valley of the river Neander, a fortuitous find which equally fortuitously has named that humanoid cousin - the Neanderthal man. Since then a rather confusing medley of various humanoid remains have been unearthed prompting paleontologists to set up a tentative tree of pre-human evolutionary development. There is no point in giving the particulars, ordering the various *homo habilis*, *homo erectus* and their modern descendants Neanderthals and *Homo sapiens* vertically and horizontally. The intriguing thing is that many of those variants co-existed in the past. This has given the idea of the parallel evolutionary development of modern human beings. Rather than ordering the various hominid species in a tree, *Homo Sapiens* draws from each branch, giving an explanation of racial diversity. The purpose of this book is to explode this theory and once and for all put it into the dustbin of paleontology.

This theory is riddled some very serious objections. One is the phenomenon of divergence, so fundamental to the history of evolution. To counter this the proponents propose continuous interbreeding keeping the various racial branches more or less on track. This by itself contradicts the basic notion of division of species, namely inability to interbreed<sup>2</sup>. In addition to that, the logistical problems of sufficient interbreeding among sparse populations with wide geographical dispersions seem almost insurmountable. Most seriously

---

<sup>2</sup> This has to be expounded upon. Different species can in fact give rise to common progeny. Classical examples being horses and donkeys, as well as lion and tigers. The point is however that those offsprings cannot breed themselves and hence there is no prolongation, the integrality of the different species is not violated. Lions and tigers stay the same and are not subsumed in a wider cloud of intermediate forms (which is the case of racial diversity, as manifested say by dogs). The ultimate reason for such discretization of biological diversity boils down to such matters as the integral nature of the number of chromosomes. However one should not forget that lions and tigers share common ancestors, thus in principle exhibiting a long chain of generationally related individuals, each link within the chain connecting members of the same species.

though, this theory comes with the insidious implications that the parallel branches of human development have not progressed equally far. In particular Australian aborigines are considered as among the most primitive representatives of the species, having progressed the least from its hominid source. More seriously though from an intellectual point of view is that the whole scenario presupposes a transcendent feature of evolution, namely a drift towards an abstract notion of humankind. Evolution is blind, it has no goals, nor any projects. In fact the very notion of progress is alien to evolution, in spite of its name. Progress is only in the eye of the beholder, and from our own exalted position, it is tempting to see us as the crowning event of a long process coming to its conclusion. Evolution can as well lead to simplification as to increased sophistication, it is all a matter of expediency, what works for the time being.

Now to really understand the difference between the so called multiregional origin of homo sapiens and the one proposed by the book, is to contemplate a purely combinatorial argument. Consider all living human beings (in fact we could take any set of individual biological beings, the argument as such is abstract, and thus widely applicable) and then the set of their mothers, then continue and consider the set of their mothers i.e. the grandmothers of all living people. Now continue this inductively, for each level we get a new set of people, and the number of mothers at each level forms a monotonically decreasing sequence, because each person has one and only one mother. Sometimes two people share a mother, and then the number of mothers goes down properly. Can this process be continued indefinitely? In other words are we considering an infinite tree? The question is almost metaphysical, but in fact it has a scientific answer. And the answer is no. The process stops. There is no abrupt stop, although it is not easy to understand how the process cannot stop abruptly, will there be mothers who have no mothers<sup>3</sup>? In particular we can ask how far back can we go and there will still be two different mothers at the same level 300 million years ago<sup>4</sup>? if so there were no humans. But if we still have different mothers at that level, it means that somehow those mothers still belong to the same species, and that we can find two parallel lineages of proto-humans which throughout those huge spans of time have stayed close enough such that their descendants 300 million years later are still able to interbreed. What this would mean would be that humans do have a very long lineage, and that they may have evolved radically throughout this time, but stayed in tandem. For one thing the two different mothers could not have belonged to different species, because due to the dogma of evolution, once lineages diverge they never converge again. Is this feasible? Note that if we assume that the number of mothers at each level never go down to one, the number 300 million years ago can be replaced by any number compatible with the age of life, pushing us down to the beginnings of life. If we find such parallel lineages hard to take, and we are talking about those that go back to the very origin of life we are forced to concede that at some point the number of mothers

---

<sup>3</sup> The notion of mother presupposes a sexual reproduction, for unicellular organisms which reproduce by division, the notion of mother and father coalesce. In asexual reproduction there will be a certain confusion of the notion of individual identity. This mental exercise highlights the difference between clearcut mathematics and messy biology.

<sup>4</sup> Note that at a given level of mothers, the age differences can vary dramatically, we are talking in this hypothetical example about millions of years

would be equal to one, namely that there would be an Eve, who would be the mother of us all. Of course this putative mother would have a mother of her own with the same property, and so on. Eve is not the first mother, but she will, by construction, have had (at least) two daughters, each of which would give rise to non-extinct maternal lineages up to the present. Furthermore this Eve would be older than any other mother that would have occurred in the process, as those others would be descendants of her. What we have enumerated is a set of mothers with non-extinct lineages of daughters. And Eve is an extreme member of this set. This combinatorical exercise is a good one, it clearly delineates what is purely formal and where the empirical knowledge enters. Without any empirical knowledge, beyond that of any organism having a mother which is still an organism, the descent could have been infinite. The argument is mathematical in the sense that it gives existence based on some general abstract principles, but in no way does it give any clue to construction. This does not mean that Eve does not exist although she may have not left any direct physical traces in the form of fragments of bones or teeth. The interesting question we can ask is how far back do we have to go to encounter her?

Classically the degree of relatedness between two species are given by their similarities. Clearly a Chimpanzee and a Human are more related to each other than either is to a fish, clearly by appearance alone. But this naive way of comparison has its pitfalls, the same question for a dolphin a tuna and an elephant would superficially considered yield the wrong answer. To compare two organisms is rather subtle, there is a hierarchy of aspects to be taken into account and it is not so clear what this hierarchy is. How much easier would it not be to consider abstract strings of symbols, each counting as such as any other, and then quantify difference simply by counting how many positions that differ. This is essentially the situation that can be encountered once you look at the DNA strings of so called mitochondrial DNA, part of the mitochondria of a cell and inherited solely from the mother. In principle all the living people on the earth should have the same mitochondrial as they are all descendants from the same woman Eve, but the copying of DNA is not entirely faithful, throughout ages small mutational changes occur. The longer the timespan the more changes, and for various reasons one may assume that the rate of change is constant, and thus the problem is simply to calibrate the rate of change. In this way by comparing the number of changes from the original Eve to present day inhabitants we can in principle determine the number of generations that separates her from us. The hitch is that we cannot get to her mitochondria, we could if we could get to her remains, but the chances that she has left any fossils are minute, and even if she had, chances of us finding it would be almost equally remote. And finally if she did and we found her, there would really be no way we could find out that we had. But of course it does not really matter. If she lived far back in time, there would be a wide spread of different mitochondrial sequences in the present population (see appendix), as any two members may differ with say  $k$  positions from Eve and thus to be expected to differ  $sk$  from each other<sup>5</sup>.

---

<sup>5</sup> In fact the argument is very general, given any two people, they are connected with their own first common maternal ancestor. For close relatives this one is easy to identify. For two siblings it is obviously their common mother, for two cousins it could be far more complicated. Either it is obvious, or it may lie fairly far back. The further back the local Eve is the more you expect the mitochondrial sequences to

To make a rather long story short, Eve is expected to have lived a mere 100'000 years ago, making people very close to each other. In fact pick two unrelated Gorillas in the same forest, samples indicate that their common Eve lie far further back in time. Modern humans are compared to other species of great Apes of a very recent lineage. Now as noted this can be done on any population, and from this we note that among African tribes the spread is considerably greater than among all other people. From this we conclude that early modern humans emerged in Africa, and a small part of them left Africa and spread all over the world. In fact one is in this way able to date the Urmutter for each population. Similar statistical studies can be made based on other chromosomes, or even just blood-types or even languages which follow the same general rules of mutation. In this way we can get very many different corroborations, which all seem to point in the same direction. In particular it seems that linguistic evolution was synchronized with human emigrations, so in principle, languages moves not like ripples on a lake, but actually with people. On this matter, systematically studied by the Italian SF, the book does not dwell.

This is of course interesting, it gives fairly precise and somewhat startling conclusions, using imaginative and oblique methods. Science at its best. Much may be made of the sophistication of the mathematics behind, which for obvious reasons is never treated in detail. The point is that in most mathematics applied beyond fundamental physics, it is not very sophisticated<sup>6</sup>. The interest is not mathematical, the interest is in the context. To divide two numbers could be very interesting. The act of division is not mathematically interesting, the interest lies entirely in what numbers are chosen to be divided, and for what reasons<sup>7</sup>. One of the conclusions it suggests, amply corroborated by other studies<sup>8</sup> is the remarkable similarity between human beings within a species. This of course tallies very well with current political correct opinions on the issue of race and the equality of all people. The latter is of course a moral standpoint, there is no reason to have expected (apart from the emergence of this moral standpoint and its ubiquity in worldreligion) it to have a scientific basis. Neanderthal people, to whose scattered remains, DNA analyses have been made recently, are not closely related to modern humans, and thus would, if still surviving into this age, have constituted a very different population. This would have given rise to moral problems of racism. A racism that would have had a scientific basis. From a philosophical point of view, people who consider science simply an encoding of social prejudices, would in this confluence not see anything other than a corroboration of their views, would they be honest enough<sup>9</sup>. Thus the author(s) take the opportunity to teach a moral lesson against racism, based on recent biological findings. Obviously one cannot take exception to such lectures, although one may find the strident tone a bit excessive,

---

differ

<sup>6</sup> In fact the gist of it can easily be explained to the layman

<sup>7</sup> The same of course applies to mathematics, when even in a subtle mathematical argument, a key idea could be the simpleminded division of two numbers, then the mathematical interest is the choice of the numbers and the reason for the division and its implications.

<sup>8</sup> humans are able to learn the mother tongue of any environment they happen to grow up in, thus there are no genetic barriers as to pronunciation or language ability peculiar to any one language

<sup>9</sup> postmodernists are usually very sensitive of their social standings, and would thus never dream of questioning currently socially accepted opinions.

as the only adversaries are on the half-lunatic fringe and enjoy no intellectual legitimacy what-so-ever. Polemics which does not run the risk of being reflected back seems a bit cheap. The author(s) need not prove that they are good guys.

The contemplation of the origin of humanity is for obvious reasons very engrossing. Such contemplations invariably take on a selfcongratulatory tone, as there are no one to object. The basic fact one has to realise is that ancient anatomically modern humans were as intellectually capable as we are, but if so how come it took them so long to achieve civilization? For literally 100'000 years there was no history, humans lived their lives as biological organisms evolved to hunt and gather, albeit on two legs rather than four, and with an unprecedented brain with capabilities way beyond what it may have been evolved for. In fact modern humans almost went extinct, at the time of this Eve their numbers were probably only to be counted in the thousands, a species of apes on the brink of extinction. Counterfactual speculation is tempting but often pointless, yet we cannot completely resist. If modern humans had never come to be (a question similar to the one what would have happened to you, would your parents never been born) what would have happened? The eventual exodus of modern humans out of Africa was not the first, but obviously one out of many. In fact hominid groups must have emerged from Africa at least two million years ago, enough time for them to have evolved independently in new environments. The Neanderthals provide a case in point, a hominid species which may actually have evolved against the backdrop of a succession of glacial periods. In fact geologically the last three million years have been characterized by a succession of glacial events interrupted by warmer periods. The dramatic character of those climate changes being mostly due to they being centered around the freezing point of water<sup>10</sup>. The Neanderthals were exquisitely adapted to such harsh conditions, and without the latter competition from anatomically moderns, they may have still been around today, but the consensus being that they would hardly have been pondering this fact very deeply. (But how could we know?)

Simple stone-tools, in fact not much more than stones crudely shaped by the chipping off of flakes, have been around hominids for a million years, showing no development. With the emergence of Homo Sapiens the tools become somewhat more sophisticated (in fact the same goes for those of the contemporary Neanderthals, who are believed to have borrowed the techniques), but more important, artefacts obviously being in the nature of art start to emerge. And then of course the spectacular cave paintings that go back some 30'000 years. Most of the technological sophistication of men is due to cultural accumulation, but some things seem to need no such basis but can develop freely during a lifetime. One may speculate whether Ice-Age art is the manifestation of a long tradition, or whether the result of individual genius? Language is another? Has the sophistication of language really increased throughout human history? Surely its objects and hence its vocabulary have, but when it comes to its intrinsic expressivity? Maybe not. If so language is not part of human technological development, but faithfully maps human intrinsic potential, and as such represents stable human intelligence. Social interaction, which can

---

<sup>10</sup> The regular waxing and waning of those climatic events have a simple explanation due to the periodic fluctuations of the orbital elements of the earth as well as its tilting of axes, all of which have straightforward explanations in terms of Newtonian Celestial Mechanics.

hardly be separated from language, is another case. Probably the subtleties of human social interaction may have hardly changed since they emerged. In fact it is argued that intelligence is basically the same as social interaction, that this has in fact been the engine which has been driving the evolution of brains. One may argue that for most people their intelligence is almost exclusively articulated through social interaction. This leads to another thing, namely the speculation as to human stone-age psychology, a discipline elevated by the name of 'evolutionary psychology'. This is bad science. It is seductively speculative but supports no falsifiable statements. The idea being the same as has been developed above, that our psychology is fixed, and thus that many puzzling features of our modern can be seen as traces left from the Ice-Age. Such ideas are very charming, and maybe also quite true, but they are not scientific, as opposed to say philosophical, as they seldom lend themselves to specifics which can be tested and hence objectively refined.

History is but one thin segment on the tenure of Homo Sapiens on this earth. It did emerge in a kind of Garden of Eden, although in the words of Hobbes, their lives might have been brutish and short<sup>11</sup>. But humankind was expelled from Eden by eventually tasting the fruit of knowledge. This knowledge has in many ways brought on a catastrophe. The biological diversity that characterized the Ice Age Earth has suffered in a very quick span, an extinction and an impoverishment, putting it on par with earlier major extinctions in the geological perspective. The New World was indeed a new world when the first humans crossed over the dried up Bering Straits, and a rather small herd of hunters, with only primitive weapons managed to exterminate the megafauna of the continents in just a mere hundred years<sup>12</sup>

So what is the future of mankind, and in fact Earth as a biological entity? It certainly looks quite grim, and in the end the author(s) bring up climactic change, which at the time of the writing was not so hot a topic as it has become later. Maybe the whole thing is after all doomed. Man was admittedly an evolutionary triumph, but in the end an evolutionary disaster stepping out of the evolutionary domain. In fact Maynard Smith argues that along with the invention of multi-cellular organisms, sexual reproduction, language should be considered an evolutionary revolution. A revolution in the end making mockery of evolution. Maybe in one hundred years or so the story has come to an end, technological fixes no longer being able to postpone the inevitable, with a wasted earth as a result. Although many people may secretly hope for some mass-extirpation of their fellow beings (as long as it does not touch upon themselves) modest attempts (relatively speaking) to put it in practice have naturally been simply appalling.

---

<sup>11</sup> However early remains of modern humans display people taller and healthier than the average of us today. Considering the limited sample of fossilized remains, those could be statistically skewed, yet it they do at least point to the possibility that such people living under primitive conditions could have been quite healthy, and in fact bigger and stronger than us today, human life putting more emphasis on brain than brawn. It is on the basis of such findings argued that the greatest revolution of man, the advent of farming, doomed him to misery.

<sup>12</sup> It is interesting to speculate why the African one was able to survive into our modern age. A more varied prey, used to hundreds of millennia to human hunters, is often argued, but somehow the argument is somewhat circular.

February 24-25, 2007 **Ulf Persson:** *Prof.em, Chalmers U.of Tech., Göteborg Sweden* [ulfp@chalmers.se](mailto:ulfp@chalmers.se)