

The “Africa—Rest of the World” Hypothesis in Evolutionary Anthropology: A Theoretical Analysis

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Evolutionary Anthropology and its Paradigms

In the field of evolutionary anthropology it is generally argued that humankind (AMH) emerged approximately 120,000 years ago in what is now known as East Africa, and at least 60-70,000 years later migrated out of Africa to populate other regions. Proponents of this argument that the region now called East Africa was the place of the origin of humankind point to the fact that many genetic traits demonstrate greater diversity in Africa's populations than elsewhere.

On account of this thesis many theorists now argue that there are good grounds for separating what they refer to as sub-Saharan Africa from the rest of the world (Cavalli-Sforza 1994:93). Evolutionary anthropologists claim to prove this hypothesis by calculating what they view as genetic distances between inhabitants of the world's major landmasses, the continents. Thus, we are informed that the genetic distance between African and non-African is 205 (separation time 100 kya), between Southeast Asian and Australian or New Guinean is 124 (55 kya), and between Caucasoid and Northeast Asian or Amerind is 84 (43 kya) (Cavalli-Sforza 1994:94).

I argue that this standard model is founded more on ideology than on scientific principles. The differentiation between Africa and the rest of the world has not justifiable basis and derives from arbitrary considerations founded on a naïve and old-fashioned conception of race. We must replace the ideologically driven candelabra models of human biological evolution with a trellis model characterized by unstructured branchings and crisscrossings.

Despite the standard scientific approach that seeks to establish significant genetic differences between human populations there is an equally valid argument that the genetic differences between geographically classified human groups is relatively insignificant. The allelic (F_{st}) variation between all human groups is less than that of, say, the impala species of Kenya and the elephants of Eastern and Southern Africa (Templeton 1999). Referring to the genetic distances between African, European, and Japanese populations, Nei and Roychoudhury (1972) arrive at the conclusion that “the interpopulational net codon differences are small compared with the intrapopulational codon differences, in all pairs of populations” (435). If the genetic distances between Africans and the other two groups is no greater than that between the Japanese and Europeans, then the claim that Africans occupy their own special branch on the tree of evolutionary biology is problematic.

Consider first a number of points. The idea of Africa as a natural, geographical area is indeed problematic. After all, the ancestors of modern humans had no conception of Africa, and when they migrated out of Africa they had no idea or notion that they were leaving the landmass we now call Africa. Thus, the idea of Africa as a separate landmass is a pure construction. It is joined to the vast Eurasian landmass at the Sinai peninsula and is proximate to the other geographical construction known as Europe. The ecologies of the African continent, by comparison, say, with Australia or small isolated islands, are not unique to that continent. What we have for the most part are local variations of species found on other continents, especially Eurasia.

It is perhaps significant but a sheer coincidence that humankind emerged in the region of Africa we now call East Africa some 120 kya. What is also significant is that early *Homo sapiens* remained on the African continent for at least 60,000 years before migrating to other continents. Thus, the descendants of those early humans who migrated out of Africa have spent less time in non-African regions than their ancestors lived in Africa. This fact would seem to complicate matters but it does so only at a superficial level. Because we have artificially constructed Africa as a separate landmass and taking into consideration the fact that humankind originated there, there will be individuals in certain areas whose ancestors lived under the same ecological conditions for at least 100,000 years while there would be other individuals in Africa whose ancestors have lived in particular areas for less time than those who have migrated out of Africa have lived in territories external to Africa.

Thus what we have in Africa is what I refer to as "mutational depth." In other words, the genetic differences between the various peoples of Africa are the greatest in the world, but only because we have artificially constructed Africa as a separate geographical entity. But what is equally true is that there are groups in Africa whose genetic distances are greater than those between some African groups and some non-African groups. On this basis it would seem obvious that the genetic distance between West Africans and Southern Africans could be as great as the distance between Africans from South-East Africa and West Asia. The reason for this would be the length of time when separation occurred (thereby establishing the basis for mutational differentials) and the physical distance between the groups (thereby establishing greater or lesser possibilities for genetic exchange).

Thus, the idea that populations in Africa constitute a separate branch on the tree of evolutionary biology derives from the fact that evolutionary biologists and human geneticists have created for the populations of Africa only a single taxonomic branch when in actual fact what is required for Africa is a set of criss-crossing and many-branched limbs. Standard evolutionary biology tends to group all of Africa on one taxonomic branch and the divergent branches tend to be comparatively few in number. For example, the human phylogenetic tree developed by Nei and Roychoudhury (1993) has only four branches for its African populations, yet there are six branches for European populations and eleven for the Asian branches. But in fact,

the opposite should be the case. The intraAfrican genetic diversity based on the fact that humans have lived longest on this artificially defined landmass would suggest that the largest cluster of branches should be reserved for the African continent. And if one were to establish a phylogenetic tree based purely on mutational distances consistent with branching time, some African groups would be as distant from each other as they are to groups outside the African continent.

Given the size of Africa, there must exist groups in Africa that have not come in contact with each other for at least 40,000-50,000 years. I have chosen 40,000 years as the separation date because archaeological research claims that the oldest fossils found outside of Africa range from 40,000 years (Europe) to 50,000 years (Australia). Because of this limited contact some genetic distances between Africa's populations would at least be equal to the genetic distances between some African groups and some non-African populations.

This proposition is accepted with difficulty by some because we tend to appeal to gross phenotype for purposes of racial differentiation. But the genes for the traits that make up gross phenotype are relatively few in number. Of all the genes that constitute human DNA, only a minority are selected according to environmental pressures. The vast majority of human genes are selected for on a purely random basis and are, as a result, found randomly distributed among the world's populations. Examples of such would be the genes for left-handedness, blood types, color blindness, and so on.

The standard evolutionary tree based on environmentally selected phenotype is therefore rather flawed. Of course the key question is, which genetic criteria should be used as the basis for population classification. An interesting solution to this problem is suggested by Templeton (1999) who argues that genetic specificities and divergencies are best explained by the concept of isolation by distance. In other words, populations that have not come in contact with each other over a relatively long period of time could be classified as distinct populations. One example offered is that of Melanesians who, though phenotypically congruent with Africa's populations, "have nearly maximal genetic divergence within humanity as a whole with respect to molecular markers" (Templeton 1999:12).

But if isolation by distance is an adequate explanation and criterion for population differentiation, it is difficult to understand how valid claims could be made about population classification according to geographical region. Templeton (1999) and Nei and Roychoudhury (1993), for example, argue that the greatest genetic divergencies are between Africans and non-Africans. If genetic divergence is a function of isolation by distance, the supposed genetic split between African and non-African cannot be sustained, since the principle of isolation by distance also applies to the populations within Africa itself (particularly since Africa constitutes approximately twenty percent of the world's land mass). As a result, there would be populations in Africa that would be isolated from each other on account of distance to

a degree equivalent to the isolation between some groups in Africa and other non-African groups.

The idea of the Africa—Rest of the World split is compromised by the fact that even within groups that are regarded as relatively homogenous from a genetic standpoint, significant qualitative differences have been recognized. P. Malaspina, *et al.* (2000) state that the “description of genetic diversity over Europe and any inference on the causes of its distribution must include data from Africa and Asia” (410). It is also reported that any discussion of the contribution of Paleolithic and Neolithic populations to the present European gene pool “should take into account the marked difference between Western and Eastern Europe for y chromosomal markers” (Malaspina, *et al.* 2000:410). The intuitive reason for these genetic divergencies is that Europe (in reality a peninsula) seemed to have been the final destination of diverse migratory trends from regions that showed large F_{st} values.

The problem with most analyses of human evolution is that authors pattern genetic and racial differentiation according to the continents (Mountain 1998). Also, in the case of Africa, only two or three mutational groupings are assumed, while for Asia and Europe dozens of mutational strands are assumed. But this assumption is hardly consistent with the claim that intraAfrican populations demonstrate more genetic diversity than those of any other area of the globe. If this is the case, then it is obviously inconsistent to argue that genetic data “suggest, however, that there has been some isolation between sub-Saharan Africa and regions outside of Africa” (Mountain 1998:33). Yet the same author also says that, “in inferred nuclear DNA population trees...African populations appear to be roughly as genetically distinct from one another as non-African populations appear to be from another” (Mountain 1998:33).

Evolutionary biologists first divide the world up into geographical regions based on arbitrary continental configurations, then they appeal to constructed models of gross phenotype for further subdivision. This is the basis for their problematic intraAfrican notion of sub-Saharan Africa (a euphemism for “black Africa”). In fact, given the claimed genetic diversity of the populations of “sub-Saharan Africa,” one could merge the populations of North Africa with the rest of Africa and not register any greater genetic diversity than that of the rest of Africa.

Evolutionary biology researchers seem to want to have it both ways when they decline to link the Melanesian populations of the East Pacific with those of Africa despite resemblances with the latter in terms of gross phenotype (Templeton 1999). Molecular markers separate the Melanesian populations of the East Pacific from those of Africa despite the fact that both groups “share dark skin, hair texture, and cranial-facial morphology” (Templeton 1999). If the morphological similarity of “racial traits” between African and Melanesian populations cannot be used as evidence for closeness of genetic distance, then the same principle ought to apply for the populations of Africa that are said to manifest the greatest genetic diversity of all grouped populations.

Even those evolutionary biologists who discount the idea of specific racial evolutionary lineages still think conceptually in terms of an Africa—Rest of the World split. Templeton (1999) argues, for example, that although no split occurred between Africans and Eurasians,

within ‘race’ diversity levels do not support the idea that Eurasians split off from Africans via a small founder population, but they do not necessarily falsify the notion that a Eurasian/African split occurred without bottleneck. Therefore, the within population genetic diversity data are inconclusive on the status of Eurasians and Africans as separate evolutionary lineages and thereby valid races. [Templeton 1999:638]

Thus, although Templeton would question the idea “commonly found in the recent literature,” of a 100,000 year divergence between Africans and Eurasians, he proposes instead the idea of an “effective divergence time” between Africa and Eurasia in terms of amounts of “restrictive gene flow among the populations.” But if one assumes this approach, then one cannot speak meaningfully of divergence between Africans and Eurasians, since intraAfrican population divergences would be expected to be of equal amplitudes and divergence times as any between some populations of Africa and some of the vast Eurasian geographical complex. In other words, one could not speak solely of a 100,000 year divergence between Africa and Eurasia as representative of a major cladogenetic trend when similar trends are to be found both in Africa and Eurasia. This argument is supported by analysis of current mtDNA, Y-DNA, and hemoglobin data.

Similar views in this regard are expressed by Korey (2000) and Eckhardt (2000) who argue against the idea of explaining the evolutionary history of humankind in terms of phylogenetic trees. Korey, for example, constructs two arbitrary Monte Carlo simulation models which, once standard evolutionary criteria are imposed, result in models very much akin to the one established by Nei and Roychoudury derived from the construction of a phylogenetic tree based on fifteen representative populations. According to this model, human evolution may be understood as a hierarchical tree of five races derived from branching over time. Korey has this to say:

if a model as absolutely crude as the one I have illustrated—one disallowing long-distance migrations, natural selection, unequal rates of gene flow within regions, variation in population size within regions, and so on—if a model so crude as this can reproduce by other means the fundamental tree-like structure popularly envisioned as the evolution of genetic diversity, then we ought strenuously to question any claim to knowledge of a human racial history. And if

our concept of race cannot be situated at the root of our history, can it usefully be situated *anywhere*." [Korey 2000:63]

The problem with the Nei-Roychoudury model is that it is based naively and superficially on geography and surface phenotype—which amounts to only 10% of the human genotype. Thus, instead of five regions one could quite easily have established a twenty region model—given the equally wide differential between intra and intergroup heterozygosity.

The fact that intragroup diversity is estimated at 85% means that one could establish the boundaries of any group arbitrarily; this would be much more the case for Africa, where genetic diversity is supposedly the greatest. Eckhardt argues similarly for multiregional continuity everywhere, thereby refuting the clean evolutionary breaks proposed by those who favor hierarchical trees. There are some problems with the orthodox multiregional model, which does not establish a necessary break between *Homo erectus* and *Homo sapiens*, and which tends to favor prehuman differentiation based on geography. This differentiation is then supposed to be mitigated by frequent gene exchange. But the main problem with the multiregional hypothesis is that it establishes its different groupings according to surface phenotype.

I believe the tendency to differentiate humanity into three to five groups is a function of human concept formation. Humans interpret the world through conceptual nets which group and arrange ideas in ways that make experiences comprehensible. The question, though, is what are the mental mechanisms that lead humans to establish the kinds of conceptual nets that they do. While some argue that human conceptual nets are mainly passive qualifiers that merely reflect how nature is in its appearances, others argue that the structure of conceptual nets are arbitrarily determined according to utilitarian considerations. Yet both approaches to understanding human experiences yield results that have been shown to be hardly incorrigible. Thus those who have argued that the arrangement of humanity into groups based on gross morphology and geographical origin is a reflection of nature have been shown to be erroneous in their thinking. It is this kind of thinking that has differentiated humanity racially roughly according to the number of continents and gross morphological characteristics.

The conceptual approach to understanding humankind has been determined to a large extent by the creation of structures on the basis of utilitarian considerations. This approach is quite common in the social sciences and has led to the difficulties involved in separating what some social theorists refer to as ideology from palpable facts. It is on this basis that I want to argue that the scientific analysis of human evolutionary history with respect to Africa has been colored by ideological considerations. In the contemporary post-Cold War era, some intellectuals suggest that the reason Africa (particularly so-called sub-Saharan Africa) has not progressed technologically at the same rate as other areas derives from an evolutionary differential between Africa's populations and those of other parts of the globe. Thus,

an ideological argument founded on evolutionary biology is appealed to instead of one founded on historical and ideological contingencies.

The work of Nei and Roychoudhury provides one example of how ideological considerations influence research in evolutionary biology. Nei and Roychoudhury first argue that "preliminary studies of blood group gene frequencies suggest that the genetic distance between Caucasians and Japanese is no closer than that between Caucasians and Negroes" (1972:435), yet they argue some years later that their unrooted phylogenetic tree of 26 representative human populations demonstrates that "African populations are genetically quite different from the other populations. Therefore, it is likely that the first evolutionary splitting of humans occurred between the African and non-African populations" (1993:938).

Africa's economic problems, resulting from colonial and post-colonial imperatives, are justified implicitly by a qualitative genetic differentiation of Africa from the rest of the world. The discussion above showed that there is no confirmable basis for this claim. All we know is that humankind originated in the eastern and southern portions of what we now call Africa and that gross phenotype traces the probable recent geographical origins of individuals. Thus, we may surmise that individuals who carry the haplotypes for blond hair and blue eyes probably originated from North West Europe, and those whose gross facial phenotype are characterized *grosso modo* by the epicanthic eye fold and straight black hair probably originated in relatively recent times from North East Asia. Thus on the basis of my discussion above I reject candalebra models of all types and accept as an explanatory model of human origins an undifferentiated amorphous trellis model with multiple lattices that converge and diverge at random.

As proof, consider the seeming random distribution of ABO blood types worldwide. But the intellectual drive to establish structure and predictability seems undiminished. Despite the fact that evidence supports the African origin of humanity, the idea of differential branching is still maintained in some quarters. It is being argued that although anatomically modern humans have their origins in Africa at least 100 kya, it was only about 40kya that modern human behavior actually began, and that this could serve as a new basis for racial differentiation between Africa and the rest of the world. This novel position has been critically discussed by McBrearty and Brooks (2000:453-563). Again, the basis for these novel ruminations are ideological. As McBrearty and Brooks claim in this regard:

there is a profound Eurocentric bias in Old World archaeology that is partly a result of research history and partly a product of the richness of the European material itself. The privileging of the European record is so entrenched in the field of archaeology that it is not even perceived by its practitioners...If it is acknowledged that both modern and human anatomy originated in Africa, the European Upper

Paleolithic is freed of the encumbrance of false rhetoric about human origins and human revolutions. [2000:534]

One of the purposes of this paper is to point out how this research orientation applies not only to specific periods of paleoarchaeology but to the very idea of evolutionary anthropology as it applies to the origins and biological evolution of humankind in Africa.

On Evolutionary Anthropology and the Theory of Science

Scholars who examine the theories of scientific research have suggested that the scientific enterprise is constructed not to present nature as it actually is, but according to pragmatic considerations, and debate whether observational terms in scientific theory are themselves just as theory-laden as properly theoretical ones. There are several epistemological precursors to the present debate. On one extreme, the paradigm of positivism was founded on the assumption that any study of the empirical world—whether in the natural or social sciences—is potentially cognitive. On the other extreme, the paradigm of phenomenology suggested that the study of the empirical world had to be contingent on the filtering and creative activity of the human mind. Examples of contemporary epistemological descendants are the Strong Programme in the Sociology of Knowledge and the Hermeneutics (Interpretive) School of social science research. Research in evolutionary anthropology should be understood in the context of this debate.

The persistence of arguments in favor of the “out-of-Africa” origins of humanity as opposed to the “multiregional hypothesis” demonstrates that evolutionary anthropology, though relying on the principles of natural science research, is influenced by human or subjectively pragmatic considerations. The idea that all humans descend from human African ancestors would not seem to fully satisfy the ideological (and emotive) needs of some researchers. This is the basis for the Wolpoff (1989) and Stringer (1989a) debate in recent years.

More recently, Stringer (2001) has presented this debate as being permuted into several models: the African Replacement model, the African Hybridization and Replacement model, and the Multiregional model. It should be noted that of these models, only the African Replacement model supports the view that all of existing humanity derives exclusively from African populations migrating to other parts of the world. The other models argue for varying degrees of hybridization between longstanding multiregional local populations and late Pleistocene demes migrating out of Africa. These models ostensibly seek support from arguments presented by Thorne and Wolpoff on the interpretation of hominid fossils from Australasia and China, coupled with earlier claims about fossil evidence from Europe (Stringer 2001:71). Stringer has been a supporter of the Replacement and Hybridization models, and claims that “the vast majority of recent work strongly supports a recent African origin

for modern humans...data are still emerging that do not necessarily fit with a complete replacement model (Stringer 2001: 73).

But again, theoretical questions may be raised against these models since each is founded on the same arbitrary, geographically founded assumption that human evolution has naturally coincided with a world divided into the three major regions of Africa, Europe, and Asia. Were one to ignore—as the hominoids and hominids did—the arbitrary geographical delineations that evolutionary biologists work with then the models that are founded on the tripartite divisions of Africa, Europe, and Asia could also apply to the African geographical space as a whole. For after all, if *Homo erectus* emerged in Africa, then the crucial question would be what were the conditions under which it evolved into *Homo sapiens*?

Arguing hypothetically, but with good cause, members of the *Homo erectus* clan based in Africa split into different, geographically dispersed subclans, one of which evolved into *Homo sapiens*. The new species would then have undergone a similar kind of branching within Africa for at least 50,000 years. At this point, at least one of the migratory branchings would have proceeded in a north-easterly direction and crossed over eventually into areas now regarded as west Asia. Further migrations would have created more branchings with some groups moving northwest into what is now known as Europe and other groups pushing due north-east into Asia proper. But similar kinds of migrations and branchings would have been taking place in Africa itself. Thus branchings of similar dispersal times and migratory distances would have been subjected to similar evolutionary pressures especially in terms of the principles of genetic drift and mutation cycles.

Assuming that the original *Homo sapiens* population represents the core human population migratory movement, radiation from this core in whatever direction would be qualitatively alike. The Africa—Rest of the World model as an explanatory paradigm for evolutionary anthropology would be rendered irrelevant. The model was first established on two assumptions: 1) fossil evidence suggested that *Homo sapiens* emerged in Eastern-Southern Africa, and 2) the genetic diversity and mutational depth in Africa suggested that a natural differentiation should be made between Africa and the rest of the world.

But the questionable implication of this would be that genetic distances between European and Asian populations would be shorter than those between African populations and those of Europe and Asia. But what would be forgotten here is that there would be myriad ranges of genetic distances between African groups themselves. The point is that the claim that Africa demonstrates the greatest genetic depth in its populations does not imply that some African groups do not demonstrate relatively short cladograms. The fundamental error in this area of evolutionary anthropology is the assumption that there has always been one core homogeneous African population despite the empirical finding that Africa's populations demonstrate the greatest genetic diversity of any single arbitrarily delineated region, as in the fact that of the thirty tree mtDNA sequenced clans found worldwide thirteen (forty

percent) have been found in Africa. Again, this fact would seem to argue against the Africa—Rest of the World hypothesis. On this basis too, mutationally derived mtDNA and y-chromosome lineages would be the greatest for the African geographical space. Orthodox theory erroneously claims the opposite.

One expects that the examination of human and hominid fossils is carried out within the context of disinterested scientific analysis and ideological indifference, and that has been the case when strictly empirical measurements (age of fossils, DNA profiles, etc.) are sought. But research “carving nature at its creases” is often intertwined with research that is configured according to ideological considerations. Thus, the idea of racial hierarchies is evidently the subtext for the construction of Africa and its geographical inhabitants as qualitatively separate from its adjoining landmasses. And even the landmass itself is further constructed to include “sub-Saharan Africa” and the rest of the continent. Consider again the more novel construction of “behaviorally modern” human as a later cultural and cognitive stage in the development of the “anatomically modern” human. The ideological intent here is to establish a cultural and cognitive gap between the ancestors of the present inhabitants of Africa and those external to Africa.

Given that the interpretive is often fused with contextually neutral analysis in evolutionary anthropology what then is the solution if the intent of the discipline is scientific? For theorist of science Ian Hacking, the natural sciences are concerned with the analysis of “indifferent kinds” while the social sciences explore “interactive kinds” (Hacking 1999:108). Of much epistemological interest, though, is “what happens if something is both an interactive kind and an indifferent kind” (Hacking 1999:108). The issue here is how to separate the seemingly real from the constructed. And this is where the question of ideology enters the picture. In the field of evolutionary biology the tendency has been to see as equally real the construction of Africa as a biological environment together with the notion that *Homo sapiens* first appeared in what is now called East Africa. We recognize that geographical environment, distance between populations, and adaptive mutational changes are the basis of genetic differentiation between groups. But construction enters the picture when ideology or subjective needs determine where we want to truncate the human species according to the idea of race.

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