

The Early Dispersions of *Homo sapiens sapiens* and proto-Human from Africa

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Abstract

Against a background of intermittent faunal exchanges between Africa and Eurasia over millions of years, we argue that evidence from three sub-fields of Anthropology point to two dispersions of *Homo sapiens sapiens* and human language out of Africa. The **first** dispersion clustered around 100 kya and clearly associated with the Middle Stone Age, probably settled most of tropical Eurasia and most of insular Southeast Asia, reaching Australia and New Guinea around 60 kya. **No dispersion north of India happened**, the human advance being confined to south Eurasia and the tropics up to Melanesia. Contact and inter-breeding with Neanderthals and their cousins, the Denisovans, probably slowed or confined the human progress beyond the tropics.

Then, we argue that a **second major** dispersion occurred around 50 ky later, often called the “**Aurignacian**” and associated with the linguistic **phyletic chain called Borean**. This second dispersion from Africa was the source of the Upper Paleolithic in Eurasia and most modern languages of Eurasia and all in the Americas.

Oriented around the ‘four fields’ model of historical anthropology, the disciplines involved were biological anthropology, archeology, and historical linguistics.

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Africans of the Interglacial period of ~100,000 to 130,000 BP began leaving the Horn of Africa to settle other regions of Africa and southwestern Asia, and ultimately southern or tropical Eurasia, Sundaland, Papua, Melanesia, and Australia. These early migrants were speaking **early varieties of human language**, genetically related to those which came after them, as well as to those ancestral to them. While there may have been more major dispersions during these early periods, we focus on just one **multi-faceted** and **reasonably well-documented** dispersion. A second dispersion came later around 50,000 BP which accomplished the settlement of Europe, the rest of Asia and the New World, as well as providing the ancestors for all modern languages of Europe, the New World, and most of Eurasia.

Our dyadic dispersal hypothesis not only accounts for language origins which have probably never been proposed before but basically replaces the current vague consensus that the period around 50,000 BP saw the first movement of language-using humans out of Africa. The stimulating theory, proposed by Klein (1),¹ which bundled ‘fully modern’ physiques with symbolic behavior, especially art, and with language, did not survive the recent explosion of archeological studies with much earlier dates for the egress of *Homo sapiens sapiens* from Africa. Moreover it was wounded by the critical responses (2) to the notion of “fully modern” and therefore symbolic behavior being denied to such early finds as Qafzeh of ~100,000.

Since our approach rests on the so-called “four fields” model, we need to stipulate how each sub-field of anthropology furnished, and furnishes, support for our basic hypothesis. Because the discipline of Physical Anthropology (Biological Anthropology) supports us in three distinct ways we shall begin with it.

Paleoanthropology: Fossil studies not only present the evolutionary antecedents of modern man, e.g., *Australopithecus*, *Homo habilis*, *Homo erectus*, etc., they also document the presence of specific discoveries of *Homo sapiens sapiens*, our own subspecies (3), but also our sometime competitor *Homo sapiens neanderthalensis* (hereinafter Neanderthal) in various parts of the world at various dates. Fossil studies have documented the presence of *Homo sapiens sapiens* (hereinafter H.s.s.) during the time period 150,000 to 50,000 in the following areas: southern Africa, Tanzania, Ethiopia-Eritrea (hereinafter Ethiopia), North Africa, southwest Asia, and Southeast Asia. Sites include Klasies River Mouth, Border Cave, Mumba, Lake Natron (footprints), Dire-Dawa, Herto, Ifri n’Ammer, Témara, Skhul-B & Qafzeh, and Zhirendong (or Zhiren Cave). The distribution appears to be rooted in Ethiopia (4), which is the sole possessor of a progression of H.s.s. fossils from 195 kya to 125 kya, as well as continuity in Middle Stone Age tool kits in the same period. Given this evidence, it is highly unlikely that H.s.s. of this time period was found in non-tropical Eurasia or the New World. (Falk, et al., 2005, 2007)

Outside of the time period but highly relevant to the hypothesis are the Flores Island (Indonesia) fossils, now seen as probably not H.s.s. (Falk, et al., 2005, 2007). Molecular bio-genetic sampling of the **modern** Flores islanders indicates that their mtDNA haplotypes are common in the Austronesian realm, while their Y chromosomes are more like mainland Austric. However Reich, et al., (2010) found Denisovan genetic material in modern Flores islanders. One is inspired to speculate about the possible Denisovan content of the fossil Flores islanders! Might the ‘hobbits’ have been Denisovans? (See molecular anthropology section.)

Human taxonomy: Classification was once a major concern of Physical Anthropology. Nowadays, however, because of the cultural warfare over the concept of “race” and bio-genetic criticisms of classifications based on phenotypes rather than genotypes, taxonomy does not enjoy its former prominence. However, there are modern

¹ The **bold numerals** in parentheses refer to **End Notes**, at the end of the article.

attempts at taxonomy which rely predominantly on non-DNA genotypic data for drawing taxonomic inferences.

Cavalli-Sforza and his colleagues (1994) sampled a world-wide range of populations from all continents and most isolates, including searching most of the literature. They calculated genotypes from phenotypic data on the following range of genetic systems: ABO, Rhesus, GammaGlobulin, KEL, Duffy, MNS, LE, LU, P1, PEPA, B, and C; PTC, PGM1 and 2, PGD, PGK1, FUT2(SE), AOD1, TF, ACP1, ADA, AK1, ALPP, AG, LPA, CP, CHE1 and 2, C3, D1, ESD, G6PD, BF, GLO1, GC, HP, JK, LDH, and HLA and HLAB (with 12 and 17 variants, respectively). These 40 loci nearly exhausted the universe of taxonomically useful genes before molecular DNA research took over.

Among their findings: (a) all modern peoples are related to each other before they are related to other taxa, including the great apes and Neanderthal. (b) African peoples form a bio-genetic cluster distinct from the rest of humanity. (c) the likely derivation of non-African peoples is from Africa, or Africa must be the homeland for humanity. Cavalli-Sforza and his colleagues in their final classification of bio-genetic (non-DNA) evidence divided humanity into **Africans** and **non-Africans** and then non-Africans into **Northeast Asians** and **Southeast Asians**. Then **Northeast Asians** separate into 'Caucasoids' (including north Africans) and 'Mongoloids' (including Amerinds) and then **Southeast Asians** divide into **Mainland & Insular** versus **Papuans & Australians** where **Mainland** equals mainland Southeast Asia, which explicitly includes most of Indonesia and the Philippines, but also south China and northeast India.

Insular means **Melanesian**, **Micronesian**, and **Polynesian** island populations and many of the peoples of the northern coasts of New Guinea. While traditional or earlier racial classifications had linked the Southeast Asians to the Mongoloids, perhaps due to the massive effects of Chinese civilization on the area, Cavalli-Sforza, et al., (1994) showed that a more complex relationship was actually the case. Finally, **Papuans** and **Australians** referred to the autochthones of New Guinea and Australia + Tasmania.

Also supplementing this synthesis in one broad region was a large scale classical (Gamma Globulin) study which found one haplotype **fanb** almost perfectly correlated with the world distribution of Austric languages, including in eastern India, but much diminished in north China, Korea, Japan, and Tibet. It appeared slightly in lower caste groups and/or 'tribals' in central India, but was absent in Australia, and nearly absent in most of central and southern New Guinea. Its highest percentages and thus its probable roots lay in mainland Southeast Asia. See Steinberg and Cook (1981). Their research on Gamma Globulin was worldwide in scope. The Austric **fanb** pattern was particularly striking, as was **fb** which was centered on Anatolia but included all of Europe and the Middle East. It included North Africa, Arabs of the Sahara, Egypt, Ethiopia, Somalia, and such isolates in East Africa as the Tutsi and Iraqw (Tanzania). Most of India, either as whole populations or as upper caste groups in the east and south, showed **fb**. The correlations with Cavalli-Sforza, et al.'s (1994) taxa were striking.

Equally striking, perhaps, are the potential links between some of their clusters and the major dispersions proposed herein, as well as the major language super-phyla.

Dispersion One, for example, when completed, had a natural geographical correlation with four great tropical Eurasiatic and Oceanic language groups, viz. Australian, Papuan, Paleo-Sundic, and Austric. **Dispersion Two** links Cavalli-Sforza, et al.'s (1994) Northeurasiatics to the Borean 'phyletic chain' and most of Earth's northern Hemisphere.

Molecular Anthropology: This is the newest of Biological Anthropology's contributions to prehistory. It is not unique to Anthropology, having its origins in Biology and being now used extensively in medical research. There are even popular television shows which use bio-genetics to explore the specific histories and genealogies of individual citizens. .

DNA-based research has not been mainly interested in overall human taxonomy, although some rather large regional classifications have been done. Besides establishing the separateness of modern humans from kindred primates such as chimpanzees, gorillas, and orangutans, studies of fossil bone genomes concluded that the Neanderthals were also distinct, albeit closer to us than the other primates. Most recently, another possible subspecies of *Homo sapiens* from Denisova Cave was discovered, albeit lacking any skeletal evidence save one finger bone and two molar teeth: it might be an east Eurasian counterpart of Neanderthal (Meyer, et al., 2012)

From the standpoint of our hypothesis one of the most important DNA studies was one of the earliest (Cann, et al., 1987). Based entirely on mitochondrial DNA (mtDNA), it proposed three important things. **First**, the probable date for "mitochondrial" EVE, the hypothetical mother of humanity or at least her mtDNA, was around 200 kya. (5)

Secondly, Africans were a moiety of humanity, i.e., the rest of the world's humans were the other "half" of mankind. Or as others put it recently "African populations show the greatest genetic diversity, with genetic variation in Eurasia, Oceania, and the Americas largely being a subset of the African diversity...with limited contribution from archaic humans..." (Schlebusch, et al., 2012). **Third**, the outside moiety or non-Africans were derived from Africa.

From this it followed, of course, that non-Africans left Africa sometime after 200 kya (the time of the mitochondrial EVE population) which dictated the time period when their descendants – H.s.s. – could move around in Africa and migrate to Eurasia. Basically, this scheme was very similar to the one produced by Cavalli-Sforza and his colleagues (1994). The roots of the belief that Africa is humanity's homeland probably go back to Darwin, at least.

Another important and wide-ranging DNA-based study (see Tishkoff and Williams, 2002) made the following conjectures:

- (a) earliest common human at 200 kya;
- (b) beginning diversification among Africans around 150 kya;
- (c) dividing of Ethiopians + non-Africans from the other Africans around 125 kya;
- (d) a split between Ethiopians ("Northeast Africans") and non-Africans at 100 kya;
- (e) a budding off of Oceanians circa 85 kya (from Eurasians);
- (f) a split between Europeans and Asians at 45 kya, possibly in Kazakhstan;
- (g) Asians and Americans diverge around 32 kya, probably in eastern Siberia.

This study in general is congruent with our dispersal scenarios. A more recent study (see Tishkoff, et al., 2009) postulates an original human homeland around the Namibia-Angola border, despite the archeological evidence of an Ethiopian origin. Yet they do propose a center for later dispersions out of Africa circa 37.5° E by 22.5° N or “near the midpoint of the Red Sea.” That point is not far from the Eritrean archeological site of Abdur Reef, which we postulate as important in the first dispersion of H.s.s. from Africa. One difference between Tishkoff and Williams (2002) (T&W) versus Cavalli-Sforza, et al., (1994) is that T&W put Ethiopians in a moiety with non-Africans, rather than in a moiety with Bushmen. Their conclusion (b) about beginning diversification among Africans circa 150 kya is dramatically supported by the Cruciani, et al.,’s (2011) judgment that the coalescence time of ‘male specific’ Y chromosome (MSY) lineages in Africa is 142 kya. Although surprising in view of the Omo-Kibish date of 195 kya, or T&W’s own 200 kya for common human, the MSY dates with lineages in central and northwest Africa definitely suggest the **Aterian** archeological sites.

One of T&W’s conclusions is that “populations in northeast Africa might have diverged from the rest of sub-Saharan Africa early in the history of modern African populations and that a subset of this northeast African population migrated out of Africa and populated the rest of the globe. Analysis of mtDNA and Y chromosome diversity supports a single East African source of migration out of Africa.” Also see Hammer, et al., (1998) for movement of Y chromosomes (and therefore males) both out of and back into Africa.

Still Cavalli-Sforza and colleagues in 1994 proposed a closer relationship between Ethiopians and Bushmen among Africans as far as “classical” or non-molecular genetic factors were concerned, while Tishkoff, et al., (2009) proposed an early link between South African Khoisan and Pigmies. The Khoisan-speaking Hadza of Tanzania were found to be almost uniquely isolated, while doubts were raised about their linguistic status as members of Khoisan. We do not share those doubts but do believe that Hadza is the most divergent member of Khoisan. Yet there are puzzling things about the Bushmen and the Khoisan language phylum. Let it suffice for now to say that the obvious age of modern humans, usually called Bushmen, in southern Africa seems much older than the probable age of Khoisan. Also the poorly known “Berg Dama” of southwest Africa speak local Khoisan and Bantu languages yet are quite distinct physically from their Bantu and Khoisan neighbors.

T&W’s point (g), the divergence between **Asians and Americans** at 32 kya, finds support in the archeological site of Yana River of around 30 kya in eastern Siberia. This site provides a date for Amerinds to begin their dispersion into North America. Despite the steadfast refusal of some leading archeologists to abandon the Clovis horizon, roughly 12.9-13.2 kya, as the first level of settlement, geneticists have been consistently proposing earlier dates, generally 15-18 kya.

Another regional molecular study by Chu, et al., (1998) presented research on a number of Southeast Asian and Chinese populations and rooted their ancestral area in Southeast Asia. Most of the mainland Southeast Asian distribution of the Austric (linguistic) super-phylum falls within the purview of the populations sampled by Chu, et

al., (1998). The homeland of that super-phylum almost certainly lies in mainland Southeast Asia, with Burma being the leading candidate. However, the presence of Nihali and Munda in India argues for a very respectable antiquity for Austric, west of Burma.

A more recent and much larger Single Nucleotide Polymorphism (SNP) study, involving 93 scholars from 40 institutions and thousands of genetic markers, focused on 73 east and Southeast Asian populations but also included a few European and African populations for comparative purposes (Abdulla, et al., 2009) It screened each sample for more than 50,000 (SNPs) sites on chromosomes where a single base can vary from one individual to another. The number of variations, presented as different haplotypes, indicates how closely related two individuals are genetically. Not surprisingly, the genetic groupings correlate with linguistic and geographic groupings. But the consortium also found that genetic diversity markedly decreased going from south to north. In addition, most of the genetic variations found in East Asian populations were also present in the Southeast Asian populations, indicating that the former likely derived from the latter. The authors conclude that humans migrated along a coastal route from the Mideast to Southeast Asia and from there moved north, gradually adapting to harsher climates.

Moreover, this study concludes that both Negrito and non-Negrito populations derive from a “single primary wave of entry of humans into the continent.” Basically, this study is a confirmation of Chu, et al., (1998). However, two other studies (Karafet, et al., 2001, Zhong, et al., 2011) conclude that North Asia was populated both from Southeast Asia and from Central Asia and that there was also some north to south migration, thereby underscoring the complexity of the peopling of Asia.

Two assertions in the SNP study require comment. There is nothing in the data which requires that a ‘coastal route’ be followed or that it derive from the Mid-East. Since an ultimate African origin is assumed, the people could have come in four different ways. Either by the south Arabian coast to India, directly by sea from Somalia to India, from the Levant via the Persian Gulf, or from Africa by sea to Indonesia, thence to Malaya. The fourth alternative is most difficult and easily rejected, but the second is not, being the ancient and well known Indian Ocean trade route.

A more serious objection can be made to their combining ‘Sino-Tibetan’ populations with ‘Tai-Kadai’ populations in a ‘major linguistic group’, which contrasts with such as ‘Altaic’, ‘Hmong-Mien’ (or Miao-Yao), and others. Sino-Tibetan as a phylum is only **very distantly** related (back in proto-human) to Tai-Kadai (or Daic) as a phylum. While Tai-Kadai is most likely a member of Austric, along with Hmong-Mien, Sino-Tibetan is **certainly not**. It is either a member of Sino-Caucasic (Starostin, 1988) or before that a component of the second major dispersion, as listed in the Borean hypothesis at the end of this paper. The Thai relationship to Chinese seemed obvious to earlier linguists, but it was due to the numerous loan words which passed between them.

In Africa, itself, recent studies contributed to the puzzling prehistory of the physically distinctive Pigmies of the central African forests (Verdu, et al., 2009). The analysis of Bantu foresters vis-à-vis Pigmies in central Africa was an especially informative local DNA study. Not only did they determine the structure of intermarriage between the groups but also, despite regional coexistence and cooperation, Bantus and

Pigmies remained distinct. Finally, theories about Pigmies simply being Bantus with glandular problems to explain their small size were vitiated by the proposed great time depth between the two populations. Thus, we may suggest another dispersion within Africa — to the west — with H.s.s. leaving forested Ethiopia to go west into the Congo forest, a mere 500 miles from the Omo, or onto the Sudanese savannahs.

Ancient DNA studies have recently provided surprising evidence of two related allotaxa of Homo with whom H.s.s. interbred to a limited extent during the early dispersions into Eurasia. Denisova Cave in the Altai yielded a finger which was analyzed for DNA and found to be distinct from either H.s.s. or Neanderthal. Recent research has found that Denisovan contributions to the genome are limited to New Guinea, Australia, the Philippines, Polynesia, Fiji, and eastern Indonesia. They are not found in western Indonesia, East Asians, and specific ethnic groups in Malaysia or the Andaman Islands. Contact with Denisovans is attested by the 4-6% of Denisovan genetic material being found in Papuans of Melanesia. The contact zone with Denisovans is most likely to have been in Southeast Asia. Thus Denisovans may have had a distribution comparable to Neanderthals, covering a major part of eastern Eurasia when first encountered by H.s.s. (Reich, et al., 2010, 2011; Meyer, et al., 2012; Green, et al., 2008, 2010). Very recently, genetic evidence of yet another hominin group has been discovered in the same Denisova cave. Traces of its enigmatic genome were found in a Neanderthal specimen and this heretofore unknown group seems to have interbred with the Denisovans (Birney & Pritchard, 2013).

At the same time it is clear that Neanderthal, whose interactions with their sister group, the Denisovans, are unknown, did interbreed with H.s.s. Contributions to the human genome by Neanderthals average about 2% for non-African populations, while Africans have no detectable Neanderthal ancestry (Birney & Pritchard, 2013). Recent evidence of contributions to the genome of Amerinds and East Asians implicates Neanderthals rather than Denisovans (Reich, et al., 2012).

Archeology: Because the discipline of Archeology supports us in clear ways we will turn to it next. **Archeology** presents well-dated sites with fossil data, material culture, evidence of tool kits, food, clothing, housing, social structure, and sometimes evidence of symbolic behavior and, with luck, music and language. An important non-cultural facet of archeological sites is the evidence they provide on the ecological setting and the climate prevailing in the area of the site. In the time period in question, archeological sites (6) relevant to the problem have been found in southern Africa, Ethiopia, Nubia, north Africa, the Levant, southern and eastern Arabia, western India, and Australia in a later time period.

Generally, the time period (interglacial) represented less rainfall tied up in glaciers and more water in lakes, rivers, and seas. While the glacial period which followed – 70 kya to 11.6 kya – saw severe drought conditions in many parts of Africa, some populations survived and some probably moved elsewhere. During the penultimate interglacial period, there also was a great deal of movement.

Material culture of H.s.s. was similar to that of Neanderthal and was often labeled **Mousterian**, particularly in those areas closest to Neanderthal regions like southwest Asia (e.g., Qafzeh in Israel). This may be the result of culture contact between Neanderthal and

H.s.s. However, much of North Africa had a similar tool kit usually labeled as **Aterian**. Yet the reports on eastern Arabia, (Jebel Faya in United Arab Emirates), assert a difference between the Qafzeh tool kit and that of Jebel Faya whose affinities supposedly lie more with Ethiopia than with the Levant. At many Aterian sites, large molars were noted. Large tooth size is also characteristic of native Australians but not of modern Europeans, although one early site in Romania (Oase) of 40 kya did have them. Teeth at Qafzeh and Skhul were similarly large.

Fundamentally, **one** of our two dispersions falls within the **Middle Stone Age** of Africa (**MSA**), while the second is coterminous with the **Late Stone Age** of Africa (**LSA**). Outside of Africa the MSA is called the **Middle Paleolithic** (**MP**) and the LSA is called the **Upper Paleolithic** (**UP**). In Europe and western Asia the MP is largely associated with Neanderthal, while in Africa it is **not**. There it is **associated with H.s.s.** In eastern Asia an indeterminate amount of territory is probably associated with the Denisovans. Except for one cave in the Altai, the Denisovans are devoid of archeological attestations; they are known almost exclusively from bio-genetic data and analyses. Since both Eurasian hominin allotaxa have interbred with H.s.s., the locations and times of such genetic exchanges are very pertinent to the pre-history of H.s.s. dispersals outside of Africa. The fact that the hemispherically remote Amerinds of the Americas have traces of Neanderthal genes, but not Denisovan genes, speaks volumes about the complex Eurasian pre-history of the American autochthones.

When the dispersions of the several species/sub-species of Homo in Africa and Asia are discussed, it is usually the case that the previous inhabitants are not mentioned. Yet sometimes they are relevant because they could easily affect the speed or ease with which the humans advanced. Following Day (1986, p.417), we can assume that the most likely prior populations were of Homo erectus (in Eurasia) or Homo heidelbergensis (Africa), wherein species interbreeding may have been possible but no bio-genetic traces are found. Moreover the concept of “**archaic**” H.s.s., versus “**modern**” (AMH) has seriously affected analysis because such sites as Qafzeh were not included for reason of being “archaic”, i.e., failing to be AMH. (See Klein, 1999 and Oppenheimer, 2009.) If there were populations of “archaic” H.s.s., then one would expect that resistance would be much greater and conquest or replacement much more difficult. Presumably **interbreeding** would become much **more likely** with probable differences in the impact on **mtDNA** and **Y** chromosome frequencies. (See Forster and Renfrew, 2012)

We have used the term ‘dispersion’ instead of ‘migration’ to label the early movements of H.s.s. towards the north and east. (7) Three separable or distinctive aspects of one basic archeological horizon are discernible. The **first** discernible movement (Aterian) is associated with North Africa and later the Sahara. It could be derived from a movement from the Sudan up the Nile, thence west to the Maghreb. However, it may have moved through Saharan wet phases via Lake Chad to the Maghreb. It shows no signs of contact with Neanderthal (see later), even though one Aterian site is found in Israel, and its presence in the Sahara was eliminated by the severe aridity of the last glacial period (70

kya to 11.6 kya). We consider Aterian largely an intra-African movement but possibly the **first movement out of Africa**.

Recent proposals (Scerri, 2012; Hublin & Klein, 2012) have de-emphasized the **tanged point** aspect of Aterian, named after the **Bir el Ater** site in Algeria, and emphasized the general MSA similarities in tool kits from remote northwestern Maghreb (e.g., Contrebandiers or **Smuggler's Cave**, Morocco) across North Africa to Egypt (**Kharga Oasis, Bir Tarfawi**) and the Sudan (**Sai Island**) and extending into the Levant (Hublin and Klein, 2012). Scerri's (2012) conclusion is that "The Aterian is not a discrete chronostratigraphic unit and tanged points cannot serve as a main criterion for the definition of an 'Aterian' complex." Also using improved dating methods, Scerri (2012) reckons that most Aterian sites in North Africa occur in the **Marine Isotope Stage (MIS) 5 and 6** or a range from **~145 ± 9 kya** at **Ifri n 'Ammar** to **61 ± 10 kya** at **Uan Tabu** (Libya). Older methods yielded a **150 kya** at the Saharan site of **Adrar Bous** in northern Niger, closer to the Sahel and Lake Chad than to the northern sites. Most 'Aterian' sites hover around the **100 ± 10 ka** range. Scerri (2012) also conjectured that the peoples were ultimately of sub-Saharan origin. In all the comparisons, **Haua Fteah** of Cyrenaica stood out as exceptional and led to the conclusion that the people of Haua Fteah were different from the other 'Aterians'. Scerri (2012) proposed that the Egyptian sites overlapped enough with so-called Nubian culture or industrial complex to suggest an eastern focus of 'Aterian' in contrast with a western focus. During periods of greater humidity 'Aterian' consisted of many sites in the western and central Sahara. See below for its proposed links to two major African linguistic phyla.

The second movement went up the Nile or via the Red Sea, and is anchored perhaps at 125 kya at Abdur Reef on the Eritrean coast. This second movement settled in the Levant (Qafzeh, Skhul) in contact with Neanderthals, and probably spread east along the Persian Gulf route to India. This could also be the source of a third facet or variant, sometimes called the "Nubian Complex" which went up the Nile but which also followed the south Arabian coast through Oman to Hormuz, thence to India and ultimately to Southeast Asia. Given the geography of the lower Red Sea area, it would not be surprising to find archeological cultures of northeastern African origin **bifurcating** between the Nile Valley and the close Tihama or lowland coast of Yemen and Saudi Arabia.

However, the dating of Layers in Tabun Cave and in **Hayonim Cave** in Israel and **16R Dune** in **India** suggest that a **fourth** movement to the Levant may have occurred much earlier, the dates being 150 kya and 135 kya, respectively. We know little else about this possible dispersion, except the probable earlier contacts with Neanderthal here and possible source of **Skhul** and **Qafzeh** cultures or influences thereupon. If 16R Dune in India is derived from Tabun Cave, it would mark the earliest move to South Asia. There is also a site in central India (**Bhimbetka**) and one in extreme south China (**Zhirendong**) which are rough contemporaries with Skhul and Qafzeh and some levels of **Jebel Faya**. (Liu, et al., 2010).

The archeological sites are very important to our hypothesis. It is understood that, because of the amounts of time involved, not all the traits or attributes of an earlier site will be continued in its descendants or younger relatives. It is well understood in archeology

that changes in environment may lead to changes in tool kits or other facets of culture. There are three things which we expect to show some continuity or which simply need to be noted, viz., presence of symbolic behavior, however measured or defined, specification of different H.s.s. populations, and some continuity or resemblances with other older or younger cultures in the technological tradition, e.g., MSA (African), or UP or Levallois, a traditional technique in working stone. In many cases only the third of our expectations can be found.

Not all of these features may be present in any given site; this is due in part to the nature of archeological sampling. Unlike the case in bio-genetics or linguistics where the population in question is often known and a sample is a calculated percentage of the whole, in fossil studies and archeology the sample is “whatever the cat dragged in.” Nature exposes data more or less at random and the job of the excavator is to make sense of those data so as to reconstruct a population and its place in history. Naturally, clever or systematic excavators will anticipate where nature will expose pieces of the past, e.g., the valley of the Awash River in Ethiopia is like a gold mine in its wealth of productive sites.

In general terms the latest archeological research suggests multiple dispersals out of Northeast Africa into Southwest Asia of up to four or five MSA / MP cultures during the last Interglacial period, around OIS 5c-5e or ~98-125 kya. Since two of them are probably “dead ends”, while two are close in time and place, with each being widespread, we think that there is one basic dispersion to deal with. It is perhaps most fruitful to conceive of these collectively as a “culture area”, as articulated by ethnologists, but one on the move, so to speak, hence a “dispersion” (see End Note 7). The four variants or cultures with their most prominent ‘type sites’ are, as follows:

As a guide to understanding the vocabulary of **modern archeological dating** systems we offer these translations of contemporary ‘acronyms’ used to label **various** systems. Thus note that **MIS** stands for “**Marine Isotope Stage**”, **OSL** represents “**Optically Stimulated Luminescence**,” while **TL** refers to “**Thermoluminescence**,” and **ESR** represents “**Electron Spin Resonance**.” **Radiocarbon dating** is constantly being tweaked, although for the present at least it is understood that it reaches to **40 kya** or maybe **50 kya** before which it is considered unreliable. The other three systems record much older dates and are considered nowadays as among the most accurate dating systems we have. Nevertheless some earlier dating systems such as ‘tree ring dating’ or calendrical match ups, e.g., with Old Egyptian king lists or Sumerian can be the most accurate of all, albeit more limited in time spans.

I. The MSA or MP, Middle Stone Age (Africa) or Middle Paleolithic (Europe), with handaxes, centripetal Levallois cores, discoids.

(A) **Abdur Reef**, Buri Peninsula, Red Sea Coast, Eritrea. Early MSA with handaxes and flake tools. (TIMS U-series on coral), 4 strata, 115-135 kya or **~125±7 kya**. Elephant, hippo, rhino, bovid, crocodile and oysters. (See Walter, et al., 2000). Bruggemann, et al., (2004) distinguishes 2 distinct tool kits: (a) handaxes of Acheulian type, made from volcanic rock and obsidian, associated with oyster beds (oyster harvesting requiring heavy duty tools) and (b) MSA flakes and blades primarily made from obsidian, mostly in near shore and beach environments and associated with the large mammals and among remains of oyster, giant clams and crab parts, possibly reflecting two tool kits of the same peoples. At later phases,

oysters were not abundant and only the flakes and blades occur, associated with bivalves, gastropods, and crustaceans.

Of the marine shell-fishing at the site, Walter, et al., (2000) state “this is the earliest well-dated evidence for human adaptation to a coastal marine environment. This new widespread adaptive strategy may, in part, signal the onset of modern human behavior, which supports an African origin for modern humans by 125 kya ago.”

Moreover there is evidence of older exploitation of marine resources in Africa, starting at least 160,000 years ago, in the “intertidal zone” which would be “over-exploited, necessitating continuous extension along the beach. This beach-combing model provides an immediate and continuous motive for unidirectional, linear migration. Evidence of marine exploitation is found at the very earliest occupation sites in Australia and most significantly at the Australian threshold dating to greater than **42 ka** cal. BP in **Jerimalai in East Timor...**” (Oppenheimer 2012, p.771).

(B) Jebel Faya 1, Sharjah, U.A.E., Assemblage C, (OSL) mean of three dates **~112 kya**; eliminating the two outliers, **123 ±10 kya**; small handaxes, thick bifacial foliates, hard hammer blades (no Levantine features); derived from E / NE African *façonnage* to make handaxes and foliates (Armitage et al.,2011).

Armitage, et al., (2011) state that “Artifacts in eastern Arabia dating to 100,000 years ago imply modern humans left Africa early, as climate fluctuated.” Baily (2009) reports that on the coast of the Red Sea Middle Paleolithic artifacts occur in terraces that are above the present waterline and believed to be of the last Interglacial. (J. Rose, 2004a, b, 2007) Finally, in support of these theses, based on archeology and bio-genetics, it was suggested “**that modern humans were present in Arabia and South Asia earlier** than currently believed, and probably coincident with the presence of *Homo sapiens* in the Levant **between ca. 130, 000 and 70,000 years ago.**”

By apparent chronological sequence, one may infer that the northeast African Abdur industry spread to Arabia. The route could be across the Bab-el-Mandeb or around the northern end of the Red Sea. Archeological surveys indicate the entire coast of the Red Sea has MSA / MP surface sites (e.g., Bailey in Petraglia & Rose, 2009).

One attempt to show that this dispersion was not productive or did not lead to further settlement in India or Southeast Asia is inherently unconvincing because the sheer size of the distribution from northeast Ethiopia to Hormuz or more than 1200 miles with many sites involved is immanently credible. See S. Oppenheimer (2012, pp.778-9).

In addition there is reason to believe that this MSA culture persisted in southern Arabia for a long time. Van Beek, Cole, and Jamme (1964) report the wide distribution and success of an African MSA Levallois-Mousterian in Hadhramaut, east Yemen, some of which was carbon¹⁴ dated to 5131 BC ± 200 yrs. Even with the probable inaccuracy of the carbon date –as exemplified by the initial youth of Qafzeh dates in Israel which were later deepened by Bar-Yosef – they do not necessarily go back to 90 kya but do suggest considerable antiquity for that industry in Yemen which was found on the surface yet underlies the Neolithic industries in Hadhramaut.

II. Early Nubian Complex, with Nubian Levallois reduction plus bifacial foliates and rare handaxes at only some sites.

(A) **Aybut Auwal**, southern Oman, Nubian complex, (OSL) $\sim 106 \pm 9$ kya and 197 ± 9 kya, **weighted mean: 106.6 ± 6.4 kya, one of 100 sites** in the **Dhofar** region, Nubian Complex (in Africa ~ 128 to **74 kya**); evidence for the spread of a distinct MSA lithic industry out-of-Africa and across the southern Red Sea sometime in the first half of MIS 5 (Rose, et al., 2011)

(B) **Sai Island Levels 1-3**, in northern Sudan, (OSL) $< 152 \pm 10$ kya (technology style) OIS 5 which equals **72-130 kya**.

Given the Rose, et al., (2011) map of Early Nubian sites in Africa, with predominance toward Egypt and not Ethiopia, and including at least one Sinai site, the preponderance of current evidence favors a Sinai route out-of-Africa for the Early Nubian Complex culture, albeit with an extension in southern Arabia.

III. Nile Denticulate Mousterian (also called ‘Mousterian K-group), with classical Levallois points; handaxes and foliates. This is a possible ‘dead end’.

These sites –although limited in number –suggest another culture also spreading from Africa to Southwest Asia. Because most of them are poorly dated it is difficult to work with them. They should be added to discussions of the Homo sapiens sapiens out-of-Africa hypothesis but primarily after more data on them are at hand.

(A) **Nazlet Khater NK-2**, Lower Nile, Upper Egypt, (geostratigraphy) **~ 100 kya** (Van Peer, 1998).

(B) **Sinai-20 Split Rock Site**, Wadi al Madibah, Zarnoq area, central eastern Sinai, about 30 km from Taba on the Gulf of Aqaba, Red Sea, (TL) Lower **84.5 ± 13 ka**, Upper **61.5 ± 8.6 ka** ‘closer to Nile Denticulate Mousterian than Middle East Levallois Mousterian’, (Kobusiewicz, et al., 2001; Kobusiewicz in Eddy, 1999).

IV. Aterian, as discussed above, with many kinds of symbolic behavior. We only mention two sites.

(A) **Ifri n’Ammar** (Morocco) (TL) Upper OS, tanged items as well as personal ornaments (shellbeads) 83.3 ± 5.6 kya Lower OS, MSA lacking tanged pieces, **130.0 ± 7.8 kya**; Upper OI, tanged items, **earliest appearance of tanging, 145 ± 9 kya** (Richter, et al., 2010).

(B) Har Karkom, Negev, Israel, at least 2 sites, HK148b, HK72a, “Aterian”, no date (Anati E., 2006 online).

We note that Aterian is excellently situated to be the source of the peculiar distribution of Niger-Congo languages, which was once described as “coming down from the Sahara like a squall line” (Kay Williams, remarks at a conference on African languages, 1987). Niger-Congo has a very eccentric distribution of branches, with the two most divergent or distinctive being located **thousands of miles apart**, on the Atlantic coast in Senegal and far to the east in Kordofan. It is also possible, given its distribution, that the Nilo-Saharan linguistic phylum is derived from the Aterian culture area. A genetic relationship between these two phyla has been proposed by a few linguists, e.g. Edgar Gregersen (1972). Murdock (1959) assembled evidence of the priority of “Negroids” in the Sahara before the advent of Berbers and Arabs there and associated them with the Niger-Congo and Nilo-Saharan linguistic phyla.

If Anati (2006) has correctly typed the HK sites as Aterian, then there is evidence for this culture “diffusing” from Africa to Southwest Asia. This possibility needs to be

added to the H.s.s. out-of-Africa hypothesis, although we view Aterian as basically an intra-African culture. Thus far, no Aterian has been reported from Arabia.

V. Tabun C Industry (with many kinds of “modern symbolic behavior”, similar in complexity to examples of Neanderthal and H.s.s. Middle Stone Age sites noted herein).

(A) **Tabun Cave**, Israel, has multiple layers ranging from ~165 to 220 kya; but C level has ~**107 kya (ESR)** and ~**122 kya (TL)**. Then **Hayonim Cave**, Israel (TL) ~**150 kya**.

(B) **Skhul** (TL, U-series, ESR) ~**between 100 and 130 kya** (perforated shell beads; pigments in multiple hues of red, orange, yellow; 10 MNI (Minimum Number of Individuals) H.s.s., including four burials, one with wild boar mandible and apparent grave goods).

(C) **Ain Hummal**, El Kown Basin, central **Syria** (TL) **98 ± 16** and **128 ± 18 kya** (Hauck, et al., 2011). Note this site is on a MIS 5e paleolake only 50 miles from the Euphrates River.

(D) **Qafzeh**, ~**90 kya** (18 MNI H.s.s., including niche depositions and possible burials, one with fallow deer antler over hands placed on the upper chest; perforated shell beads, some with pigment stains, red, yellow and black and broken Levallois core, triangular in shape with incised mostly parallel stroke marks; at least 84 ochre pieces with some at every level, some working traces.)

It seems no one has yet adequately integrated these Tabun C sites into an out-of-Africa scenario. There is no robust evidence for Tabun C beyond the geographic areas noted; it may be a local southwest Asian phenomenon or only absence of evidence for a more distant dispersal of the industry. Moreover, according to Klein's table (1999, p.430) there are non-trivial differences between dates obtained by ESR and those obtained by TL. Thus Tabun-Level C is ~**90-125 kya** by ESR and ~**95-150 kya** by TL. Both Skhul and Qafzeh are ~**100 kya** by both measures but the TL dating estimates extend to ~**110 kya**.

However, it is not likely that material **from** Tabun layers of **165-220 kya** to Qafzeh around **90 kya** to Ras el-Kelb of **52 kya** – a span of **130,000** and **168,000 years** respectively – represents the same culture or even the same tradition. Both Skhul and Qafzeh have become famous as sites for modern humans coming out-of-Africa. If they are merely local phenomena, as the argument goes, how did they get to the Levant in the first place, since they are the first H.s.s. found in that area? Both Richard Klein and Michael Day were puzzled by or aware of differences between levels at Tabun and other sites. At least one level at Tabun was diagnosed by Day as Neanderthal with three of the top four levels labeled as Levallois-Mousterian, suggesting H.s.s. or Neanderthal, while **levels 5 and 6** contained **Acheulian** hand axes, a product probably of *Homo erectus*! But at Skhul human remains were undoubtedly H.s.s., as were those at Qafzeh. So in the Tabun “tradition” we find both Neanderthals and *Homo sapiens sapiens*. This suggests borrowing far more than cultural continuity. Moreover in the Levant, contact with Neanderthal is well known archeologically (Personal communication, Ofer Bar-Yosef, several times in the past 20 years). Needless to say, Tabun Cave could be the **epicenter** of H.s.s. and Neanderthal biogenetic exchanges, now being **found by geneticists**.

The sites mentioned above suggest that, based on archeological evidence, there is no more plausible time period than the MIS 5 Interglacial for *Homo sapiens sapiens* to disperse out-of-Africa.

While the next set of sites usually lack exact counterparts in Southwest Asia, they do serve, basically, to document the LSA base in eastern Africa. Later ones also help to establish the Late Stone Age or Upper Paleolithic (in European terms).

Dispersion Two. The great “Aurignacian” or the LSA dispersal from Africa

Roughly 50,000 years after the great initial dispersion from the Horn of Africa, during a time of glaciers in the north and dry conditions in the south, the second movement of H.s.s. took place. This time, however, these humans held a clear **technological advantage** over both older human residents and their cousins the Neanderthals and Denisovans. The **bow and arrow**, perhaps backed up by ‘atlatls’ and improved spears, conferred **hunting advantages** with conceivably added competitive benefits in **inter-tribal strife**. The archeological inferences to support this hypothesis are derived from analysis of the numerous **small stone points** found widely in LSA sites, particularly in southern Africa. (See McBrearty, 2012).

Variouly called ‘**microliths**’ or ‘**bladelets**’ or ‘**flakes**’ or even ‘**blades**’ these small stones formed the points of arrows, the part meant to penetrate the hide of their prey. Those composed of **obsidian** could be razor sharp and quite **easily obtained** given the presence of numerous old **vocanic** eruptions in Ethiopia and East Africa where they are usually found. In Ethiopia where archeological digs are far less common than in southern Africa, and far far less common than in Europe, obsidian flakes are so common on the surface that local people have a name for them, either [balč’i] (Oromo) or [balč’ut] (Amharic).

We cannot as yet reconstruct the **genius of an invention** which knows the strength of a bent pole or stick combined with a string under tension to **hurl a stick** with a **sharp point** on it at other objects or animals. But we can infer its probable age from its presence as the **weapon of choice** even today among **all** known African hunters, including the **Pigmies** of the Congo forest, the **Bushmen** of southern Africa, the Khoisan-speaking **Hadza** and **Sandawe** of Tanzania, the several varieties of **East African hunters** in Kenya and their **cousins** in the Horn. This is particularly striking because from a pan-African standpoint it is only the isolated hunters who prefer the bow; virtually all inter-tribal warfare was conducted by **spear and shield**.

The important discovery of **arrow poisons** additionally increased the efficacy of the arrow. It was not necessary to bring down one’s prey by force of impact but simple **infection** would suffice. This required extensive **knowledge** of the botanical environment and the slow, often dangerous, **discovery** of poisonous plant life, probably by **women** who are usually the gatherers among African foragers.

Any date around 50 kya corresponds to the start date for H.s.s. out-of-Africa, advocated by Richard Klein (2008). With these ‘Late MSA’ and ‘Early LSA’ sites we get into the **second dispersion** which is explicitly associated with **Klein’s hypothesis** and with

our Borean hypothesis. While we **agree** with Klein's **dates and sites** associated with this dispersion—his '**Aurignacian**'—we hear from non-quotable sources that Klein himself is less sure of his hypothesis these days. Be that 'rumour' true or untrue, we believe that the LSA traveled from northeast Africa to southwest Asia in the time frame that Klein proposed for his 'Aurignacian'. While we will present below the Borean hypothesis as a firm support for the 'Aurignacian', here we present three supporting type sites. Klein (1999, p.401) lists and locates many more than this.

1. **Enkapune ya Muto** (GtJi12), near Lake Naivasha, Kenya, Level RBL4; **Endingi industry**, backed geometric microliths **>50 kya** (14C) **> 41 ka**; Level GG/GL (OL) **Nasampolai industry**, (ObsHyd) **46 kya**; thus between **40 and ~50 kya**; DBL1; **Sakutiek industry** (14C) **35.8**; on eggshell **39.9 ±1.6**; probably OIS3 (McBrearty & Brooks, 2000; Ambrose, 1998, 2002)
2. **Mumba Shelter**, Tanzania, **Level V** (Y-series, AAR) **45-65 kya**: Late MSA "Mumba industry" crescents, geometrics, backed knives; comparable to Howiespoort (South Africa). Mumba level V is 60,000 years after Mumba level VI-B. It is probably part of the "Aurignacian" or "Borean" period or Upper Paleolithic (in European terms).
3. **Ksar Akil**, Lebanon, **Level VII-XIII (14C) 32 kya**, '**Late UP Carinated**' or "Levantine Aurignacian" (obsolete term), classic blade and bladelet products, soft hammer, cobble for ochre crushing.

There is a dearth of sites bearing H.s.s. fossils before 45,000 years ago in Europe, Central Asia, northern China-Mongolia, or Siberia or throughout the Americas. One investigator who has looked into the same problem supports this statement. See Oppenheimer (2009) who anticipated parts of our hypothesis. He proposed that 'anatomically modern humans' (AMH) reached the Levant around **120 kya** but "failed to continue to Europe" because of Neanderthals. Then "later" (**85 kya**) AMH took the "southern route" to India, via south Arabia, inhabiting mainland and insular Southeast Asia around **70 kya**, or at least before the **great Toba** volcanic eruptions (YTT), at 74 kya, then reaching Australia between **48 and 60** (or **65 kya** by bio-genetic calculations), **eastern Papua** (Huon Peninsula) by **40 kya** and **Melanesia (Bismarck Archipelago)** circa **40 kya**. We would add sites **Malakunanja** in far northern Australia at **52 kya** and **Lake Mungo** in New South Wales, Australia, with AMH burials at **43-45 kya**. Since the earliest known dates for Australia and eastern New Guinea differ by 20,000 years (60 kya versus 40 kya), we may have some empirical indication of the speed with which H.s.s. advanced from region to region. Naturally, it would only take one aberrant archeological date to change the whole equation! However, some confirmation is provided by the archeological date for **Manus Island** in the Admiralties of 20 kya. **Manus** is about 250 ocean miles (402 km) from **Papua**.

The above dates, despite appearances, are associated with the **first dispersion only**. There is no evidence that the second dispersion or the Borean language phylum intruded upon these tropical areas. Only much later would the Austric expansion and the Sinitic Chinese have clear measurable effects, primarily in establishing the Austronesian realm.

Then around 50 kya and consistent with our Borean hypothesis, Oppenheimer has AMH moving into Europe **and** Central Asia, reaching the Bering Straits between **22 and**

25 kya, crossing a land bridge, and dispersing into the Americas. His proposed movement into Europe follows a route from the Levant, through Anatolia to southeast Europe by **48 kya**.

We support this part of his hypothesis because it coincides with a probable movement linking the North African sites of **Dabba** and **Haua Fteah**, the **late MSA of the Nile Valley**, **Boker Tachtit** in Israel, the Turkish site of **Üçağızlı** in South Central Anatolia, and **Kostenki** on the Don in Europe. There is an intriguing, if not remarkable, link from Kostenki to Kara-Tenesh (layer 3) and Denisova Cave (layers 13-18) in the Altai. One possible sub-taxon of Borean which links Basque to Caucasian and Burushaski also connects them to Yeniseian, which is closer to the Altai. One mtDNA-based bio-genetic study, looking into Basque prehistory, connected the Basques to “Western Asia” (González, et al., 2006). They concluded that “It has been demonstrated, for the first time, that Basques show the oldest lineages in Europe for subhaplogroup U8a. Coalescence times for these lineages suggest their presence in the Basque country since the Upper Paleolithic.”

More importantly, the roots of his Upper Paleolithic movements into Europe and Central Asia are **not** in Africa, as are ours and Klein's, but rather in southern Asia. His movement travels from India to the Levant via (roughly) the ‘fertile crescent’. Oppenheimer may be correct in postulating a Southeast Asian nesting area but that proposal cannot handle the Borean hypothesis which is anchored in the Horn of Africa and has strong representation in Europe, the Levant, and Caucasus (e.g., Basque, Sumerian, Elamitic, Kartvelian, and Caucasian). Moreover, his Southeast Asian nesting area has also to account for his Upper Paleolithic expansion from both South Asia and northeast China into Central Asia, where we have only the first. Granted that we both see blockage to northern movements during much of this long period due to Neanderthals presumably, our hypothesis and Klein's furnish the means (i.e., Upper Paleolithic technology, especially the **bow and arrow**) for breaking out of the nesting area toward the north (McBrearty, 2012; Brown, et al., 2012). Oppenheimer's excellent model lacks that impetus. But **see below** the discussion of Oppenheimer's most **recent** proposals.

With respect to the dearth of sites north of India we need to stress that this is an archeological observation. A number of bio-genetic studies have postulated a few movements to the north, based on bio-genetic inferences. We hesitate to repeat the old bromide that the absence of evidence is not evidence of absence but it is still true.

What might have a bearing on these issues would be more site data from Southeast Asia and especially Indonesia. In addition, there are Malayan sites which do not yet testify clearly in terms of dates and tool kits. Some site names are **Bukit Jawa**, **Kampung**, **Temelong**, and **Lawin**. As summed up in Oppenheimer's more recent publication, sites in the Philippines and Indonesia (Oppenheimer, 2012) are all post-Toba, i.e., **74 kya**, with the possible exception of **Punung Cave's** tooth in Luzon. **Callao** on Luzon is close at **70 kya**. **Tabon Cave** in **Palawan**, Philippines has an upper date of **47 kya** and sure AMH fossils. Farther east in Melanesia, Papua, and Australia sites cluster in the **40 ky to 60 ky** range, while bio-genetic studies indicate a deeper genetic connection among Australians, Papuans, and Melanesians than they have with Southeast Asians (Oppenheimer, 2012). Recall Cavalli-Sforza and colleagues' (1994) ‘Mainland’ versus ‘Insular’ Southeastasians.

As a final comment on our overall considerations, we quote from remarks made about Asian archeology by John Shea (Science News, August, 2012, p.26).

Some researchers argue that the meeting of biologically-related species in ancient East Asia was also a meeting of equal minds. Implements created by both species range from simple flakes struck off stones to finely chiseled blades ... Homo populations apparently adapted tool making to environmental conditions rather than crafting increasingly complex tools over time. Contrary to conventional archeological thinking, no tool style distinguishes Neanderthal from H. sapiens.

His scenario suggests that sophisticated thinking needed for manufacturing diverse tool kits emerged 200,000 year ago or more in both species [which we call sub-species]. Tentatively we can suggest that archeological data seem to confirm a closer, if not very old, relationship between H.s.s. fossils and MSA tool kits in the cooler, higher region of eastern Africa from the Horn to the Cape of Good Hope. We owe part of this suggestion to Alison Brooks (2006) and John Shea (2009). However, since that highland region is closely correlated with the earliest H.s.s. fossils, we may be looking at shared retentions from the seminal period.

Historical Linguistics: Language, the third leg of our hypothesis, is very clear in its contribution and undeniably very controversial. Reconstructing prehistory appears, fundamentally, to depend on human bodies, material culture, and languages, although languages only become relevant after about 200 kya. Archeology and paleoanthropology were the most handicapped of our four disciplines because of their sampling problems, except for the study of societies which had writing systems, invented 6000 years ago in the Near East. We give one example of this problem. Some years ago one of us was confronted with the possible presence of cattle in the Sahara. Were they recently introduced or had there been cattle in earlier times in the Sahara? The archeology emphatically said NO! So we concluded that there had been no Saharan cattle, even though other evidence suggested that there had been. Several years later, however, an archeologist found cattle dated to the 5th millennium BC in the Sahara. Despite sampling problems, rich and well-excavated sites remain one of the most valuable things in prehistoric research. And rich areas where the sampling problem was trivial because of dense settlement, like the Nile Valley and lower Mesopotamia, became hugely informative.

In addition linguistic genetic taxonomy is capable of precise classification of every language in an area along with possible ideas on interactions between or among the languages (i.e., borrowing), reasonable clues to homelands, clear indications of time depth up to a point, and indications of outside affiliations. For example, the importance of Indo-European studies with their clear and mostly stable internal taxonomy, probable home land and time depth mostly agreed on is recognized fully by both archeology and bio-genetics.

Thus, the third source of our evidence is the field of historical linguistics, especially a modern version of it called “long range comparison.” Clearly, this field has been missing in most scientific discussions of H.s.s. evolution and various possible pathways from Africa to other parts of the world. This was partly due to the explosion of bio-genetic research and the value of bio-genetic hypotheses; but partly due to conservative reactions in linguistics which inhibited deeper taxonomic and historical work. Yet linguistics remains very valuable as a tool for prehistoric research, even though its chronologies often leave much

to be desired. Thus, while linguistics and bio-genetics frequently support each other taxonomically, they both prosper from working with archeology and its better dates.

We propose an **ancestral human** language, hereinafter **proto-Human**, which underlies **all** languages spoken by **modern** humans. It is associated with H.s.s. of **150 ± kya**, and was located primarily within the Horn of Africa, and branches or dialects of it accompanied H.s.s., dispersing to tropical Eurasia and Australia –and throughout Africa. We also note that the proto-language of the homeland **(8)** would differ from dispersion to dispersion. Thinking about how this might be conceptualized is much easier if we consider one ancient example of such a progression: Old Egyptian of 3300 BC evolving into Middle Egyptian of 2200 BC, evolving into New Egyptian of 1200 BC, and terminating in Coptic dialects of the first millennium AD. A clear genetic language progression of three millennia, dominating a river valley for 640 kilometers and a delta about 200 kilometers wide. There may have been other languages in Egypt at various times (e.g., Meroitic in the far south, Canaanite in the far northeast, Hyksos or Persian invaders at times, or Berber in the far northwest, etc.) but no one ended Egyptian hegemony until Arabic took over.

We do not deny other linguistic possibilities, such as earlier languages evolving or being invented independently of proto-human. We deny no Neanderthal speech, nor do we hold any position in the rich speculation on the hardware of language origins, including human neurology, functional brain areas, hyoid bones, mouth shapes, etc. We regard it as possible that several languages may have been invented or developed by various of our ancestors and relatives, since the development of genus Homo. We think it possible that large regions of human speech disappeared at various times in the past. Unknown and undescribed, they are lost to our data base forever. Such losses have been proposed for parts of South America and southern Australia (Swadesh, 1960), but the clearest case of all would be the original speech of the African pigmies. **(9)** However, no one has been able to propose a plausible companion to proto-Human. We know of theoretical possibilities but proto-Human and her 5000 to 6000 daughters are all that we can actually identify.

One often hears that few linguists doubt that all known human languages have a common ancestor, although conservative historical linguists deny that such can be demonstrated empirically.

From the first contacts of Spaniards with Native Americans in the 1500s or the experiences of Dutch explorers in the 1600s (Australia) and Portuguese in the 1500s (New Guinea), no doubts are reported about the humanness of the languages or the people, notwithstanding perceptions of aboriginal “strangeness.” For that reason, as well as the testimony of modern linguists, the languages of Australia and New Guinea can be assigned membership in the human language family, with the explicit presumption of descent from a common ancestor. In addition, some attempts have been made to show empirically that there is an overall human language taxon which we can call proto-Human. **(10)**

The concept of “universal grammar” or UG – by which theoretical linguists mean a basic underlying management for all human grammars – explicitly includes Australian and Papuan languages too (Noam Chomsky, personal communication, March 5, 2011). Whatever the shortcomings of that theory (UG), the inclusion of these languages in universal theory testifies to their incorporation in the human family of languages. There is thus no need to try to demonstrate empirically that Australian and Papuan languages are

part of the human language family. We assume that as a given, as something agreed upon by linguists. (11)

Unless an intervening ancestor can be found, the implication is that Papuan and Australian languages are derived from proto-Human. The same logic would apply to the **Austriac** super-phylum of languages, as well as scattered remnants in insular Southeast Asia, like Andamanese, Timor, Ternate (Halmahera), etc. Thus, we may have four major stocks to relate to each other, viz., Austriac, Paleo-Sundic, Papuan, and Australian. Sundaland is completely dominated by Austronesian, which is a branch of Austriac, otherwise dominant in Southeast Asia. Austriac also includes Nihali of central India and possibly Ainu of Japan. Paleo-Sundic is much broken up but still includes Kusunda of Nepal, Andamanese, and what might be called western Papuan (from Timor to Bird's Head in New Guinea). Papuan is most of New Guinea and much of Melanesia and probably Tasmania, while Australian is Australia. Usher (2008) tentatively proposes that Australian is probably related to the Trans New Guinea segment of Papuan. We choose not to follow that suggestion for the nonce.

Our reason for **stressing** the languages of tropical Asia and Australasia is to **emphasize their importance** to global level taxonomy, to point out their **large numbers**, and to remind those with western Eurasian and African orientations that the tropical cousins are the **least studied** of all the world's tongues. We probably know **less** about their **prehistory**, their **sub-classifications**, and **reconstructions**, than we know about any comparable large region in the world, **even including South America**.

The original human emigration that carried some proto-Human speakers north from Eritrea or the Sudan into the Near East, continued thence into southern Asia and thence into Sundaland and the Sahul. Because of the resulting antiquity and the consequent erosion of evidence, the linguistic phyla of Southeast Asia, Sundaland, New Guinea, and Australia have been resistant to classification, even to "long rangers."

Joseph Greenberg grouped what we call Paleo-Sundic and Papuan into one large phylum or super-phylum called Indo-Pacific; which he thought might later be seen to include Australian (see Grace, 1968). This classification was achieved before more recent data on Kusunda, Nihali, and many of the Papuan languages were published. Some British and Australian linguists criticized Greenberg's hypothesis, but no serious efforts were made to falsify it. Usher's recent appraisal (2006) neither rejects entirely nor supports Greenberg's hypothesis but rather examines the various segments of the Indo-Pacific realm which we pragmatically divide into two parts, Paleo-Sundic and Papuan.

This old tropical region from Bengal to Tasmania contains around 2000 languages, showing that circa 40% of 5000 human languages are found there or 33% if the total be 6000. Outside of Afroasiatic there are another 1200 or so languages which never left Africa. Thus two tropical areas of the globe are home to between 53% and 64% of human languages. This observation is very much akin to the biological one that tropical oceans contain many more species but northern oceans have fewer species with much larger populations.

Given the general but unquantified relationship between language change and time, linguists usually see linguistic diversity as an indication of time depth of occupancy in an area. A diversity of dialects means 'relatively recent', while diversity of phyla or families

means much greater time depth. Thus, Italian dialects reflect a shorter time depth when compared with India with its six different phyla. The **Austriac** super-phylum has been somewhat controversial because great time depths may have eroded evidence of relationship; it is composed of four phyla and concentrated mainly in Southeast Asia with one branch (Austronesian) spread clear across the Pacific to Hawaii and the Indian Ocean to Madagascar. Two of Austriac's four phyla, **Daic** and **Miao-Yao**, are heavily concentrated in the China-Viet Nam border areas, while the other two phyla are well represented in nearby areas. (12)

What basis could there be to deny that some aboriginal language in Oceania, for example, was descended from proto-Human? Once X has been called a language by some human observer, what else could it be than a human natural language? Despite the ease with which journalists and the general public move “language” around from meaning to meaning, linguists are usually quite certain what a human natural language is – with considerable precision. It is a form of speaking, with a clearly defined phonological system, a grammar (morphology and syntax) which governs the arrangements possible for the core elements, and a collection usually in the thousands of morphemes or morphemic combinations (words and grammemes) which carry or encapsulate most of the semantic freight of human conversation. While any language is subject to change for numerous reasons, most of its content is passed on intact from generation to generation, such that grandfathers can converse with little difficulty with grandchildren. Languages are historical products; they are inherited, maintained or altered, and passed on to new generations. Here the analogy with biological populations and genes is striking.

The major problem with linguistic genetic taxonomy is dating or time depth. The deep chronology of human language occupation of Southeast Asia, New Guinea, and Australia, for example, is well beyond the capacity of any **glottochronological** system known so far because only **binary** comparisons are used. With a one percent retention on a Swadesh list (between two languages), one cannot exceed a time depth of 35,000 years or 18 ky to 35 ky as a range. The central value of 26 ky is the most likely. (13)

Each of the African phyla “max out” at the one percent (1%) level, meaning that we could not calculate the time of some ancestor linking **two** of them (e.g., Afrasian and Khoisan). There is hope that glottochronology may be extended by using large numbers of languages, 10 languages or 20 languages might yield many more millennia. But for the moment, the great super-phyla from India to Tasmania seem undatable by glottochronology but are probably much older than 26 ky or even 35 ky, if linked to each other (e.g., Austriac and Papuan). The **human occupation** of the region clearly must be much **older than 50 or 60 ky**. Indeed, this basic conclusion is reinforced by Petraglia's recent findings of archeological sites in India which purportedly predate the Toba volcanic eruptions in Sumatra of 74,000 BP. (14)

Even between the twigs of the great Austriac tree quite respectable time exists among closely related languages in one small cluster of Bornean languages. Maanyan and Malagasy of the Barito cluster of the Borneo branch of the Western Malayo-Polynesian branch of Austronesian sub-phylum are said to be **~1960 years** apart (Dyen, 1953), an estimate which is coincident with historical data on the migration of the Malagasy from Borneo to Madagascar (Murdoch, 1959, p.209).

Yet dating back to Wilhelm Schmidt in 1926 the taxonomy of Austric has remained controversial. Most are agreed that three primary groups of languages are involved, viz., Miao-Yao, Austroasiatic (Mon Khmer and Munda), and Austro-Tai (Daic and the huge Austronesian family, will most likely turn out to be from southeast China, ultimately). The reluctance of some good scholars to accept the whole Austric package is probably an argument for that super-phylum's **antiquity** in Southeast Asia. It reminds one of Niger-Congo which is nearly 600 languages spread over one compact area with another 500 spread over a huge land area, the southern third of Africa. No doubt, if that great African phylum were spread over hundreds of islands from Shanghai to Fiji, it too would still be controversial!

A rather similar situation appears vis-à-vis Australian. It has 15 sub-phyla, by the reckoning of Ruhlen's (1991) Guide. Fourteen of them are confined to a relatively small region in northern Australia (roughly Arnhemland and Kimberly Plateau), while one sub-phylum, Pama-Nyungan, occupies all the rest of Australia. There can hardly be any doubt that the north is where proto-Australian entered the continent and it is tempting to equate the date of proto-Australian with the archeological dates of northern Australia, especially **Malakunanja** in far northern Australia at **52 kya**.

How are we to assign time depths to the great clusters of phyla in these Oceanic and south Eurasian regions when their depths so obviously exceed any glottochronological calculations? Recent papers employing phylogenetic systematic techniques from computational biology have tried to fill the void. See Gray, et al., (2009) and Bouckaert, et al., (2012). Since initial testing of these methods has sometimes turned up indecisive results, we deem the approaches as promising but hesitate to rely on them. As archeology and linguistics have done in the past, we can resort to **relative dating**; something is older or younger than something else with a known or probable date or at least time period. But to begin with, since we have two or three clusters, we try to see which of them is older or younger than the others.

On the question of which language stock is correlated with which dispersion we offer a tentative answer, following the logic of the relative dating. The two Papuan stocks and Australian are probably the older because of their **locations**, greater **cladistic diversity**, ostensibly **greater time depth in India** (witness Kusunda in Nepal), and some tendency to appear **stratigraphically bottommost** in its area (witness Kusunda again, also Timor, Alor, Pantar, and Halmahera in Indonesia plus 23 languages in Melanesia). Yet the two Papuan stocks and Australian **lack such features in relation to each other**. Except for its vast Austronesian branch, whose genetic coherence has always seemed obvious to linguists, Austric has no representation outside of Southeast Asia and India. In the Bay of Bengal where Andamanese and Nicobarese occupy separate islands, the Nicobarese group, including Shompen, has numerous Austric relatives on the mainland (see van Driem, 2008), while many linguists are not even certain that Andamanese has any relatives at all, and even the relationship between North and South Andamanese is not easily granted. Austric therefore probably associates with a later phase of the **first dispersion**, circa 100 kya, while **Paleo-Sundic, Papuan, and Australian (PSPA)** probably derive from an earlier phase, circa 125 kya. Given the substantial time gap between these initial dates and the oldest archeological date on Australia, circa 60 kya, we can only assume that PSPA had a long

term nesting area in India or Southeast Asia before moving toward Australia, possibly under pressure from the early Austric arrivals. Conversely, the presence of PSPA in Indonesia possibly impeded the expansion of early Austric into the Pacific. Oppenheimer, (2009) also proposed a similar nesting area.

The Borean Hypothesis

Following the example of Joseph Greenberg and specifically oriented towards the concept of “valid taxon” which underlies his work on Indo-European and its closest relatives, we focus on the **Afrasian** (Greenberg’s Afroasiatic, formerly ‘Hamito-Semitic’) phylum of languages (15) as the western anchor of a great chain of languages extending across Eurasia and down to Tierra del Fuego in the Americas. The basic hypothesis is that **Afrasian** is related to the following groups of languages before it is related to any others, as they too are so related. (16) These kindred languages or phyla are as follows:

- a) **Kartvelian** of the Caucasus;
- b) **Dravidian** of greater India;
- c) **Sumerian, Elamitic** and a few other fossil languages of the ancient Near East;
- d) **Eurasiatic** of Greenberg, beginning with **Etruscan** in the far west and ending with **Eskimo-Aleut** in the far east. It also includes **Indo-European, Uralic, Altaic, Korean, Japanese, Gilyak, and Chukotian**. With (a), (b), and **Afrasian**, it equals “**Nostratic**” according to some linguists; however, see below.
- e) **Vasco-Caucasic**, proposed by Bengtson (**Basque** of Iberia, **Caucasic** of the Caucasus);
- f) **Burushaski** of Pakistan and **Yeniseian** of west Siberia (Ket, Kott, Assan, Pumpokol);
- g) **Tibeto-Burman** (Sino-Tibetan) of eastern Asia;
- h) **Na-Dene** of western North America (Haida, Tlingit, Eyak and 31 Athapascan languages);
- i) **Amerind** outlined by Greenberg (a valid taxon with large contrasts among sub-taxa).

Although this list is noncommittal about linkages within the whole, some clusters have been strongly suggested in the literature. Except for Afrasian and Amerind which are kept distinct as anchor groups, the following clumps or clusters have been proposed. Groups (a), (b), and (d) are very convincingly combined as “Nostratic,” beginning with Holger Pedersen (1931), followed by Illič-Svityč (1965), Aharon Dolgopolsky (1998), and

Allan Bomhard (2006). The evidence as presented recently by Dolgopolsky and Bomhard is probably as thorough and complete as any ever presented to justify a linguistic taxon, with the possible exception of Indo-European itself. Differences from our presentation exist; for example, Bomhard would not include Japanese, Korean, or Sumerian at this time. He would, however, change Etruscan's group name to Tyrrhenian which would also include Pictish, Rhaetic and Lemnian. Most recently Sergei Jatsemirskij (2011) has proposed adding Minoan (of Crete) to Tyrrhenian. Some would also link Elamitic to (b) Dravidian as Elamo-Dravidian.

More recent than Nostratic hypotheses are the proposals that groups (e) through (h) also form a significant cluster, sometimes to be called Vasco-Dene or Dene-Caucasic. The work of Sergei Starostin, Sergei Nikolayev, and John Bengtson has been most important in stitching this group together. (17)

The Vasco-Dene cluster is perhaps most notable because of the wide range of the phonological systems in different groups; Tibeto-Burman and Na-Dene, for example, are very contrastive phonetically. Na-Dene may be closer to Tibeto-Burman (Sino-Tibetan) than to other sub-taxa. Borean has clear similarities to M. Swadesh's Vasco-Dene, never fully published because of his untimely death. Modern research agrees with the Sino-Dene hypothesis proposed by Edward Sapir 94 years ago! **Ainu** is still controversial, being classified as a branch of Eurasiatic by some and as a branch of Austric by others. Japanese ethnologists have correspondingly proposed dual influences, one from the northwest and the other from the tropics; these are reflected in the Yayoi and Jomon archeological cultures, backed up by dental research. (See Hanihara, 1992). Chinese and its kin have phonemic tones and lack the striking glottalized consonants of Na-Dene. The same is true for their more remote relatives in the Caucasus with glottalics and pharyngeals. Yet dissimilarity and similarity in phonology are **typological** traits and need not necessarily reflect **genetic** relationships. (18)

It is clear that the Borean hypothesis involves a super-phylum some of whose sub-taxa are themselves super-phyla. The term "**phyletic chain**" is introduced as a possible label, because the Borean groups show a chain-like distribution from southern Ethiopia through southwestern Eurasia to northeast Asia and down to the southern tip of the New World. Borean is predominantly associated with human populations of "Caucasoid" or "Mongoloid" physical appearance (Cavalli-Sforza, et al.,'s 1994 Northeurasiatics), the major exceptions being southern India, southern China, southwestern Ethiopia, northern Nigeria, and the Chad Republic. Borean as a chain is closely associated with the appearance of the **Late Stone Age in Africa** and the **Upper Paleolithic** in the Levant, Europe, and western Eurasia from 50,000 to 35,000 years ago.

The key problem with Borean is the validity of the taxon. Do these languages show kinship with each other before they do to outsiders, such as the four super-phyla of tropical Eurasia and New Guinea-Australia and the other African super-phyla (Niger-Congo, Nilo-Saharan, and Khoisan)? For example, Greenberg saw empirical links between Dravidian and Nilo-Saharan. Trombetti found links between Dravidian and Australian. Do those links **exceed** what can be found between Dravidian, for example, and Na-Dene? And of course, how many of such links can reasonably be attributed to **borrowing**, linguistic gene

flow? Given the time depths between specific phyla, hence the relative scarcity of retrievable cognates, such linkages may be difficult to obtain.

Since we have proposed that Borean is a very long chain of phyla from Ethiopia to the bottom of South America, one may ask what evidence there is for **direction of movement**. Did it originate in Tierra del Fuego, or more likely Mexico, or did it branch out from its middle, roughly Kazakhstan? One scholar (Oppenheimer, 2012) has proposed the Near East as the post-African or secondary 'homeland', influenced no doubt by the wealth of ancient written languages in that area, e.g., Sumerian, Akkadian, Elamitic, Hurrian, Hittite, etc., with Egyptian nearby. Drawing upon the strengths of 'dispersal theory' (Diebold, 1960; Dyen, 1956) and a consensus among Africanist scholars, we conclude that Ethiopia is clearly the homeland of Afrasian and that direction of dispersal or movement has been **outward** from Ethiopia. Despite a long tradition of **Asiatic Semitic** dominance in language and 'civilization' – long represented by the 'conquering Caucasoid cattle men' or 'Hamites' (see Greenberg, 1963) – we think that tradition was **mistaken**. Semitic, Egyptian, and Berber **came from Ethiopia**. This is the clearest indication of direction along the whole Borean chain and is quite consistent with the known movement of LSA from northeast Africa to southwest Asia and beyond. No doubt the second clearest indication of movement within Borean, except for Na-Dene, is the virtually certain movement of Etruscan and Indo-European into Europe from an Eurasiatic dispersal area in Kazakhstan or generally Central Asia.

Evidence for the Borean hypothesis has been presented (Fleming, 1991, 2002) but a more massive effort is now underway. Historical linguists have characteristically been very slow and very careful before accepting such large hypotheses because they are fundamentally empirical questions, not demonstrable in theory, nor to be rejected that way either.

Summation

We have argued for chronologies and a logic of association that is very unusual in modern anthropology and related fields like phylogenetics in biology, paleobotany, or Pleistocene Geology. Because there are problems virtually unique to historical linguistics, we must discuss our theses at a basic level. To accomplish this goal, we pay attention to three foci of discussion.

- **Chronology** (One of two key problems in historical linguistics)
- **The logic of associations** (Linking Borean and the Upper Paleolithic, as a kind of 'epistemic correlation')
- **Taxonomy**: Long range taxonomies.

Chronology: It is not hard to imagine the condition of **modern archeology without** its several fine dating systems. Think back only to the mid-20th century before carbon¹⁴ and other systems of dating became routine. Much the same is true of paleoanthropology. Remember the puzzling Near Eastern sites of **Qafzeh**, **Skhul**, and

others before **Bar-Yosef** re-dated them to more than **90,000 BP**. Abruptly we had a date for *Homo sapiens sapiens* outside of Africa, contemporary with Neanderthal, and associated with the Middle Paleolithic. Archeologists have worked long and hard to build up a system of **reliable chronology** which is vital to archeological hypotheses about the prehistory of humankind. Their dating system is the **envy** of linguistics and ethnology. And while the realm of **proper written history** extends as far back as the **5th millennium BC**, it is irrelevant to much of Eurasia, most of Africa, Southeast Asia and the Pacific, and the entire New World **before 1492 AD**.

Historical linguistics has **not labored** to generate a dating system comparable to that of archeology. While a kind of **probable inference** endeavor has been recommended by some, based on reconstruction of ancestral words relating to flora, fauna, and climate, it is more useful in **proposing homelands** than dates. The well-known dating system invented by Morris Swadesh, usually called glottochronology, has been criticized since its inception. Linguists have seemed more interested in **refuting Swadesh's** system than in improving it. In a striking contrast, in the same half century, **archeology achieved** an excellent dating system through **tweaking** the original hypotheses, while linguistics did not tweak Swadesh's glottochronology into **usefulness**. It also seems that **mathematics** was used more to attack glottochronology than to improve the system.

Nowadays linguistics has **no viable chronology**, and no generally agreed upon way of dating proposed ancestral homelands or the frequent expansion events common to linguistic prehistory, like that of the Indo-Europeans, the Bantu, or the vast dispersion of Austronesian from Madagascar to Hawaii. Not to be blocked by the failures of linguistics, prehistorians now commonly attach their linguistic reconstructions to the solid conclusions of archeology or to the less reliable chronological proposals of bio-genetics. We propose that bio-genetic dates generally err on the low side of 'true' or 'real' dates, although we cannot prove this point. However that state of affairs may be changing because of new mutation rate estimates in bio-genetics. **(19)** It is surely symptomatic that Joseph Greenberg, master classifier of the 20th century and one encouraging prehistory, did **not** publish anything on **glottochronology** until 1987 when he suggested some improvements. This undoubtedly left him with no alternative, other than the accepted Clovis archeological dates, for **dating the advent of Amerind** in North America. Those dates are now believed to be underestimates for the antiquity of the earliest human entry into the Americas by both geneticists and many archeologists.

The Logic of Associations

When we make several linguistic hypotheses in our paper, such as proto-Human in Ethiopia or Australian and Papuan deriving from the **first** dispersion circa 125,000 BP, we are making probability statements of the form "it is more likely that ...". These are **judgments of relationships, rather than mathematical probabilities**. They might take the form of "My husband is probably still working." Or "The American people will probably not bring back 'prohibition'." Or "That rope will surely break if you swing on it!" These are conclusions, if not predictions, based on someone's **assessment** of the **evidence** in any particular case. These statements are more familiar in a different form, such as

“George Washington did more for his country than any president who followed him.” Or “It wasn’t his money or his looks that made John Wayne so famous; ’twas his horses.”

These statements are basic to **hypothesis formation**, as conceived by philosophers of science. They sum up the evidence, the facts, concerning something and propose the likely judgment. They can be **tested empirically** and judged true or false. There is **no** necessary involvement of **mathematics**. Will the rope break if you swing on it? You test that hypothesis by swinging on the rope!

This in truth leads to a strange kind of “epistemic correlation” (Northrop, 1947) – one between a hopeful but undated linguistic proposal and an accurate, definite archeological site or culture. While such correlations abound in modern prehistorical studies, they are in principle very wobbly! Yet so pessimistic are most historical linguists about dating that they may prefer the security of archeology to linguistic dates.

We argue that a **concatenation of factors** (or Whewell’s consilience of induction) makes a particular hypothesis most likely. In the case of Ethiopia as homeland for proto-Human, evidence of **archeology**, **paleoanthropology**, and **geography** support it as the most likely place in Africa, with southern Africa in hot pursuit, for the **homeland of H.s.s.** at the time of the first dispersions. (Africa as the ultimate homeland is a consensus nowadays.) Since another consensus holds that **human natural language** is most clearly associated with H.s.s., the homeland of H.s.s. clearly can claim to be the homeland of proto-Human.

When we propose **two major dispersions** of humans from Africa at different time periods, we correlate them with **two distinct sets of languages**, supported strongly by **two** different clusters of **biological** humans (phenotypic and genotypic) correlated with **three general areas** and supported by specific datable archeological sites and two generally **distinguishable ‘horizons’**.

Thus the first dispersion began leaving Africa circa 125,000 BP, traveled across northern Arabia and the Persian Gulf to India and Southeast Asia, encountering Neanderthal and Denisovan populations on the way, settled insular Southeast Asia, eventually reaching Australia by 60,000 BP at least and New Guinea perhaps simultaneously. Although largely replaced or absorbed by later dispersions from Africa, remnants remain in the so-called ‘Australoid realm’ between India and Australia; remnants not just in physique as in southern India but in language as in Kusunda of Nepal and far more plausibly in the Andaman Islands which are some 5000 km west of Darwin (Australia). The modern peoples derived from the first dispersions consist of the Kusunda (Nepal), the Andamanese, the native Australians, Papuans, some east Indonesians (e.g., Timor, Alor, Halmahera) and many Melanesians. Traditional race classifications commonly linked these peoples, usually under the rubric of ‘Australoid’, and even with the demise of ‘race’ in American physical anthropology, bio-genetic classifications still link them together. The Andamanese have also been called ‘Australoid’ and/or ‘Negrito’, but such are not supported by bio-genetic affiliations (Thangaraj, et al., 2005).

Linguistic Genetic or Phylogenetic Taxonomy

A critical hypothesis of our paper is that there are **three major groups** of languages which are **correlated** with the **two dispersions out of Africa**. This proposal reaches **far beyond** the usual classifications of world languages. The **first** has no standard label and almost lacks scholarly efforts to join them. We have chosen to call this cluster Paleo-Sundic, Papuan, and Australian or PSPA. We do **not** treat this as a **genetic unit**, although a very few linguists have done so (e.g., Trombetti, Gatti, and Swadesh). Around **900** languages exceeds our capacity to deal with the question of their genetic unity **right now**, even though we believe that sometime soon their genetic unity will be proposed in a more robust manner. If Australian and Papuan have a common ancestor, it most likely lies more than 60,000 years behind them. If Andamanese connects up more with Paleo-Sundic and Papuan, as seems likely, then this suggests that these two, aka **Indo-Pacific**, separated from Australian much earlier than that.

The first dispersion also associates with a known super-phylum, Austric. Although this huge super-phylum of 1100+ languages is somewhat controversial, this is due to the **depth of diversity** in mainland Southeast Asia more than the number of **languages**. The great mass of Austronesian, circa **960 languages**, has been accepted generally for several generations and the reconstruction of proto-Austronesian is well advanced (e.g., Blust, 2009). Linking small phyla like Daic, Miao-Yao, or Austro-Asiatic to Austronesian has been a sticking point for some linguists but most 'long rangers' (in both the USA and Russia) accept Austric, as do some in western Europe. This was not always primarily an insular super-phylum, since it is now fairly well known that Daic at least and probably Miao-Yao too, **occupied much of China**, at least up to the level of Chang (Yangtse) river, before the advance of the Sinitic Chinese moving south. So strong is the presence of Austric in Southeast Asia that it is reasonable to suppose that the **people of Zhirendong (100,000 BP** more or less) were **ancestral** to Austric. In China, Yunnan, Guizhou, and a mountain region (Mulan) are known for ethnic diversity and conservatism. Home to the Miao of Austric, this area is ethnically part of Southeast Asia, not Sinitic China. Most research reports distinguish between these peoples and the Han Chinese. Recently, M. Erard reported that 24 new languages had been discovered in Yunnan through field work done by J. Pelky. See Erard (2009).

Could Austric be related more to Australian and its brethren than to Borean, because Austric is closer to Australian in time? Russian colleagues suggest that Austric is related to Borean (see **16**). It is also striking that proposals of Austric-Papuan or Austric-Australian relationships are very rare. No doubt such exist; we just do not know of them. One caution would be that Austric languages have been in contact with Borean languages for a long time, upwards of 40,000 years in India and China, while Papuans and Australians had little Borean contact until very recently. Linguistic **contact** over millennia would ordinarily lead to **borrowing** and **influence**. The Chinese-Daic example of this is now famous with each side receiving a great deal from the other.

The **second major dispersion** proposes a new linguistic group, one of the largest in the world in **population sizes** and **geographical extent**. Borean is **bold but well supported**. Its 1500 languages occupy all of North and South America, Europe, half of

Africa, most of Eurasia, and almost all of Australia. They dominate the world culturally and politically, having done so for hundreds of years. Borean is a **younger** linguistic **taxon** than its counterparts in Africa and the southwest Pacific. It is thus **more likely** to have **preserved evidence** of its past than its counterparts have. It also has the **advantage** of containing all of the **ancient** languages (e.g., Sumerian, Egyptian, Sanskrit, Chinese, Mayan, et al.) known to us, excepting Meroitic, and the bulk of the inquiry into relationships and ancestral forms. It is almost certainly true, but undocumented, that more historical linguistic work has been done on a few Borean languages than on **all the non-Borean languages of the world**.

Although one of us (Fleming) first proposed Borean to the world, the hypothesis is truly the outcome of fruitful work done by many people. Borean depends on the tremendous increase in research on three main foci after World War II. The **Nostratic** hypothesis, the **Dene-Caucasic** hypothesis, and the **Amerind** hypothesis – each a tremendous effort and accomplishment in itself – these are the sine qua non of Borean. Each was amply documented, often bitterly opposed, but also revised to suit the more cogent criticisms. Many linguists were critical of these hypotheses; in the case of Amerind the opponents might be described as angry. Many more linguists handled the problem of new taxa such as these by disregarding them. This is perhaps not what scientists are expected to do with new hypotheses.

Looking at this from the logic of science, rather than polemically or judgmentally, we may agree that hypotheses are meant to be tested. In an overwhelmingly empirical science like historical linguistics –which cannot do laboratory testing –one has to examine the evidence and determine how much of it is to be condemned, i.e., falsified. There are tried and true ways to falsify historical hypotheses in historical linguistics. Seek to destroy (falsify) the proposed cognates, **incipient etymologies**, upon which **both sound laws and reconstruction depend**. If one says that English ‘hound’, French ‘chien’ and Avestan ‘span’ are cognate, i.e., descended from a common form, then one might reject that proposal as absurd because the forms all look different.

Since few linguists produce perfect sets of proposed cognates, critics often win arguments about specific etymologies. So the key question becomes **how many** etymologies can be destroyed before the **entire hypothesis** has to be abandoned **as false**? Or how many parts of the whole have to survive for the whole to remain credible? Before we use our imaginations on that question, we find a surprise! The question was once answered publicly by Dr. Ives Goddard, as one opposing Amerind, at a serious meeting of opponents and proponents of Greenberg's historical methodology at Stanford University in 1986. **Goddard's answer was 35 convincing etymologies**. One of us was sitting directly behind Goddard when he made that remark. It seemed a perfectly reasonable quantity to demand. Since Greenberg mustered **281 Amerind etymologies**, not just regional ones, and we cannot believe that **247** of them were **mistaken**, we think that Amerind **passed** the Goddard test!

Thus far presentations about Borean have been largely ignored, except by ‘long rangers’ in Russia and the USA. Its **scope and number** of languages discourages many from attempting to evaluate it. However on a simple level we can report that Borean has already **passed** the Goddard test. As of now some **47 lexical** etymologies, as well as **27**

'**grammemes**' (grammatical morphemes) have been compiled. If only half of them are true, which would be a low performance record, still our **37 true** ones would suggest that when we begin our **massive comparative work**, we will pass the Goddard test and have plenty of room to spare. **Then we are off to greater Papua!**

A comment comes from Greenberg (1987, Preface). Concerning etymologies, he writes:

Particularly in regard to etymologies, any user of existing dictionaries, even of intensely studied languages, will encounter numerous instances in which the same form has been assigned to different etymological entities by different scholars, or even in which the same form has erroneously been included in different etymologies.... Still while some etymologies are virtually certain or highly probable, others are marginal and will perhaps never be finally decided..... If the strength of Indo-European studies is largely based on the existence, in a few instances at least, of very old sources, the strength of Amerindian studies is simply the vast number of languages. The synchronic breadth becomes the source of diachronic depth.

The **hundreds** of Papuan and African languages are a basis for **hope, not despair**. We advise, lest it be forgotten, that each proposed **cognate set** is in fact a **small hypothesis**, that each **form (morpheme)** in the set is descended from a **common ancestor**.

A most recent study by Rasmussen, et al., (2011) produces DNA evidence that H.s.s. entered eastern Asia between 62 kya and 75 kya. Their other finding was of a second "migration" around 25 kya to 38 kya. Their data were taken from a native Australian's hair (before European contact), as well as from Han Chinese, West African (Yoruba) and Europeans. We caution that these population samples may be inadequate for a global conclusion, with samples from Papua, Burma, south India, and southwest Ethiopia being desirable additions. We also wonder if their dates might turn out to be underestimates for their two migrational episodes as predicted by the proposed dates of our dispersal hypotheses.

Oppenheimer's Most Recent Proposals: A Critique

While any number of bio-genetic studies have suggested dates for H.s.s. emergence from Africa and specific connections to various non-African populations, there have been only five more ambitious general proposals: Richard Klein, in several publications, Alison Brooks and Sally McBrearty in two major publications, Stephen Oppenheimer in two different scenarios, plus Henn, Cavalli-Sforza, and Feldman (2011). Interestingly, only one (Klein) specified that human language accompanied H.s.s. out of Africa. Klein grounded his proposals in the **LSA** or **UP** of **50 kya** or later, while **denying** full H.s.s. or **AMH** status to earlier emergences like **Qafzeh**. His human language accompaniment was more like a **suitcase**, with no phylogeny or detail on various language phyla. Since Klein ran afoul of definitional problems of AMH and his commitment to UP dates, his proposal is probably being quietly shelved. Brooks (2006) focused on the period around 70 kya, thus breaking out of Klein's limitations. She had no language component. Oppenheimer basically had two proposals, an earlier and the most recent (2012). His first proposal was far richer in non-African information than either Klein's or Brooks'. It included a date of **120 kya** for

initial out-of-Africa, explanations for the peopling of southern Eurasia and Australasia-Oceania, and a sojourn in the south before proposed movements into northern Eurasia, roughly the same as Klein's 'Aurignacian'. But there was no human language component. (More on Henn and colleagues below.)

Oppenheimer's more recent proposal (2012) also lacks any human language involvement but a deep commitment to bio-genetic findings is central to his new hypotheses. His overall hypothesis is anchored in two propositions, the first that there was **only one dispersion** from Africa and second that no serious or lasting emigrations took place before the great Toba volcano exploded circa **74 kya**. Oppenheimer runs roughshod over the archeological sites so important to earlier dates, like Abdur Reef, Jebel Faya, and both Qafzeh and Zhirendong, either denying their further expansion, i.e., genetic 'dead ends', or associating them with 'archaic' humanity, thus repeating Klein's argument and probable error, or criticizing the site report itself. By standing firmly on the validity of bio-genetic dating (molecular clock) and mtDNA phylogeny, Oppenheimer sets himself up for the falsification provided by the recent reforms in bio-genetic dating (see **19** below). That is to say, most of his genetic dates are probably many thousands of years too young or too shallow.

The arbitrariness of his dismissal of so many archeological dates is for us good reason to reject his basic hypothesis. How do you know that Jebel Faya was a genetic dead end? Our answer is that Jebel Faya represents the eastern end of a long line of sites extending back to Ethiopia. Why would one assume that this culture was terminal at Hormuz? But most of all why assume that bio-genetic data and conclusions are paramount, so that they overrule archeological results and totally ignore those very valuable linguistic conclusions?

Addenda

Part One. One recent development, too fresh to have been thoroughly evaluated, is the proposed new population of Homo which is said to have co-existed with H.s.s. in central and southern Africa, most probably in the Rift Valley lakes region of East Africa. This conjecture is based on bio-genetic data from three hunter-gatherer populations, viz. Pigmies of Cameroon plus Hadza and Sandawe of Tanzania. Data were gathered on 15 individual genomes and not limited to mtDNA or Y-chromosome data. The modern Africans sampled are said to have about 2% of their genomes of alien origin. The terminal date for contact with the new hominin group was reckoned to be from 70 kya to 30 kya, the estimated date for the separation of the three African populations. (See Lachance, J., et al., 2012)

Part Two. One new and strongly supportive linguistic date can be added to our hypotheses. According to Perreault and Mathew (P&M) (2012), the original human language, or what we call proto-Human, is to be associated with the Middle Stone Age (Africa), "**sometime between 350-150 kya**" or **250 kya** on average. This is based on archeological evidence for the MSA as a whole. Using fossil evidence would give **195-160 kya** for AMH humans. Supposing that "fossils classified as Homo helmei, that may be anatomically modern or nearly modern, are dated to **300-250 kya**" that would extend the inquiry beyond our parameters. (We do not believe that Homo helmei data are sufficiently

well known or analyzed to be helpful.) Our proto-Human is **defined linguistically**, as the root or ancestral language to all modern or known human languages – nothing more. P&M posit a language which would be correlated with the archeology of the African Middle Stone Age. Their proto-language is not defined linguistically. Rather it is a **theoretical** entity and need not necessarily be the same as our proto-Human or possibly be anywhere near it in geography or time period.

P&M's proposal is welcome and excellently presented. Since it does consist of a whole host of assumptions about phonetic change and fairly ad hoc assumptions about outcomes, it is difficult to use or even evaluate properly. Moreover, in at least two aspects it is empirically mistaken. They use **60 to 70 kya** as the dates for the emergence of H.s.s. from Africa. Given current information, as we have outlined before, those dates are **40 ky** to **70 ky** too young or **too shallow**, either archeologically or as calculated by recent reforms of the molecular clock. (19) Their ground assumption that the number of phonemes decreases with distance from the source, or what linguists would call “homelands,” can be falsified several times, e.g., Bantu of South Africa, Na-Dene in relation to its obvious homeland in eastern Asia, or Modern South Arabian in relation to northern Semitic languages such as Ugaritic, Hebrew, Akkadian, et al.. Indeed, their important case of Khoisan languages contradicts their main thesis. Here a language called !Xun allegedly has 141 phonemes which far exceeds the counts of 62 in Hadza or 54 in Sandawe up in the Khoisan homeland in Tanzania – the opposite of what is predicted.

Perhaps the most surprising thing about P&M's study is that it was not written by linguists, probably, because the matter of increase or decrease in phonemes was put in **areal** terms, **not** in language taxonomy and reconstruction terms. A linguist would have compared proto-languages with daughter languages, not African languages with Asian languages. As some Africanist linguists have done, one can be sceptical of the Khoisan language with 141 phonemes. Nor would a historical linguist lump together many Southeast Asian languages to compare with Andamanese. If they are not genetically related, how can one be compared to the other in terms of source and outcome?

Part Three. Although we hesitate to present **primary data on linguistic analyses**, one Borean etymology is so striking and convincing that we have decided to include it. Joseph Greenberg (2002, p.2-3) argued briefly that Eurasiatic was clearly the closest relative of Amerind and included an etymology for “**hand, give, measure**”, citing data from 17 Eurasiatic languages, 6 of which were proto-languages, compared with 31 Amerind languages, 8 of which were proto-languages. Here we wish to extend that etymology to the rest of Borean by including relevant data in the same meanings from Afrasian and other segments besides Eurasiatic and Amerind.

In the meaning of “give” in Afrasian there is: Old Egyptian [**1m1**]; North Omotic: Kafa, Anfillo, Shinasha, Mocha [**ʔim**], Chara [**im**]; Yemsa (Janjero) [**ima**], Basketo [**um**], Male [**ing**], Dorze, Ganjule [**im**] and [**ing**], Oyda [**ing**], Koyra (Koorete) [**ih**]; South Omotic: Dime [**ʔim**], Galila [**ʔum**], Hamar [**im**]; North Cushitic: Beja [**hiw**]; Central Cushitic (Agau): Bilen [**iw**] and [**uw**], Khamta/Chamir [**iiw**] or [**iuw**]; East Cushitic: Hadiya [**uuw**], Sidamo [**uw**], Darasa (Gede^ʔo) [**iuw**], Burji [**u**] or [**w**]; South Cushitic: Mbugu (Ma^ʔa) [**awi**] possibly from [**qaw**] and not cognate. Or Mbugu [**ʔo**]; Semitic:

Ethiopic: Ennemor [**yiim**] and [**ama**], Mesmes [**hamo**]. It is not found in Berber or Chadic, except probably in the South Bauchi group of Chadic in the meaning of “hand” or “arm.”

In the meaning of “hand” or “arm” or “cubit” in Afrasian there is: **Old Egyptian** [**mH**] ‘cubit’; **Chadic**: **West Chadic**: Polci [**aam**], Ngizim [**amai**], Bade [**âemi**], Geji [**aŋ**], Guruntum [**aa**] ~ [**ŋ**]; **Central Chadic**: Gisiga [**han**] and **Semitic** ‘cubit’: Old South Arabian [**ʔmt**], plural [**ʔmm**] and [**ʔmn**], Soqotri [**ʔemeh**], Hebrew [**ʔammaa**], Ancient Aramaic [**ʔmh**], Syriac [**ʔammitaa**], Ugaritic [**amt**], Mandaic [**ama**], Akkadian [**ammatu**] and Geez [**ʔimat**]. Modern Ethiopic: Tigre [**ʔammat**], Tigrinya [**ʔimmat**].

In the possible Vasco-Dene section of Borean, thanks to Sergei Starostin and his colleagues we have proto-Sino-Caucasic [**VmVn**] for “to give” and for proto-North Caucasian [**mēHwV**] for “hand, extremity”, where [**V**] = some vowel and [**H**] is the pharyngeal. Individual languages include Avar [**maHu**], Chadakolob [**mahu**], Chamalal [**maH**] and Karata [**nihe**] from [***mihe**]. In Dargwa there is proto-Dargwa [**meH**] “hollow of hand, handful” and Lak [**yama**] in [**kʷi-yama**] = “handful”. In Lezghian the proto-language has [***hem**] or [***hema**] and Udi specifically has [**aim**]. In the form of [**mV**] the root is embedded in West Caucasian or Abkhaz-Adyghe languages, for example Abkhaz [**ma-čwa**] = “finger”. In West Caucasian original [**m**] often changes to [**p**] by dissimilation from [**ma-pa**].

In the Basque and Yeniseian ‘branches’ of Vasco-Dene which Starostin calls ‘Sino-Caucasian’ we have proto-Yeniseian [***pVn**]. Proto-Yeniseian has no [***m**], except in a few expressive words, for which [**p**] is substituted. Proto-Basque, the ancestor of seven modern varieties or ‘dialects’, has [***eman**] ‘to give’.

In Burushaski, Yasin dialect, [**maś**] = “stretch out hand, touch with fingers, [**d-mas**] = ‘hand over’, [**mać**] ‘fingers, [**meş**] ‘finger’.

We have not searched Tibeto-Burman, Na-Dene, Kartvelian, or Dravidian languages because of space limitations of this paper.

Part Four. While bio-genetic closeness or distance does not prove their linguistic genetic counterparts, the two are often highly correlated. Because of their acute oceanic separation from their Asian cousins it is often difficult to determine which phylum is closest to the isolated **Na-Dene** group in North America. Strong biogenetic clues, based on **recent** and **highly focused** research (Reich, et al., 2012), indicate Na-Dene ties to **Sino-Tibetan**, as **the closest bio-genetic kin of the Na-Dene**. Since the **primary population** of their sample was **Han Chinese**, rather than a more generalized “Chinese” with its likelihood of including absorbed elements **of Austric origin** from south China, the study tends to back up the linguistic hypotheses of Vasco-Dene which link Sino-Tibetan and Na-Dene with Yeniseian and the Caucasus. Modern biological research agrees with the venturesome Sino-Dene linguistic hypothesis advanced by Edward Sapir 94 years ago! Linguists such as Swadesh and Greenberg, among others, have also agreed with Sapir’s conclusion and saluted a hypothesis willing to cross the vast distances of the Pacific Ocean to connect two very different taxa!

Part Five. Until recently, the primacy of Ethiopia or the Horn of Africa or “northeastern Africa” as the springboard for H.s.s. dispersions to Asia has not been seriously challenged. Two recent proposals, however, need to be discussed briefly. One (Hublin and Klein, 2012) proposes that the **Aterian** segment of MSA was a **possible**

source of modern human expansion. This is due to the fact that “**Aterian craniodental fossils resemble fossils ...at the Skhul and Qafzeh Caves in Israel.**” This proposal represents a basic change in Klein’s viewpoint, expressed earlier. Otherwise, we would **not deny** that the Aterian branch of MSA had a part to play in the first dispersion, as did the Ethiopian branches, e.g., Abdur Reef and Aduma and probably Nile Nubian. But Scerri (2012) also reckoned that the (Aterian) peoples were ultimately of sub-Saharan origin, or as we have proposed, they dispersed from Ethiopia by way of the Sahel and Lake Chad and the (interglacial) Saharan wet spots. The pattern is strongly reminiscent of a much later one of the pastoral Neolithic in the Saharan region.

Another hypothesis (Henn, et al., 2011) puts the human source population in southern Africa among the ancestors of the Bushmen hunter-gatherers. As characterized by Hublin and Klein (2012), Henn’s thesis is that “...**the source population for modern humans, including the group that expanded from Africa to Eurasia roughly 60,000 years ago, resided in southern Africa.**” As we have argued earlier, the cooler uplands of eastern Africa from Eritrea to South Africa shared the MSA and no specific region has as yet triumphed as **The Source area**. As argued, however, Henn, et al.’s (2011) **dates** are much **too recent** to claim the honor of source. Since their reasoning is fundamentally based on bio-genetics, rather than archeology plus bio-genetics, their proposed numbers such as 60,000 BP are almost certainly wrong, and on the face of it, much younger than the archeologically-based Ethiopian dates. Finally, like many studies coming out recently, their proposed hunter-gatherer populations are mostly Khoisan speakers or Pigmies; the numerous Nilo-Saharan and Afrasian-speaking hunters of Kenya, Uganda, and the Horn are **consistently ignored**. Since most of the Horn has not been sampled bio-genetically, and hunters are fairly common, it is surely premature to conclude that Kalahari hunters are the last word in bio-genetic contributions to prehistory.

End Notes

- 1) See Klein (1999) and for a recent re-statement of his argument see (2008). Many scholars have adopted his viewpoint on “fully modern,” while many have not. The argument is basically theoretical, focused on “fully modern behavior.”
- 2) Ethnologist Daniel McCall once noted that the modern English were markedly different in musical and artistic (painting) creativity from the French and the Germans. (See McCall, 2007). The anthropologist, Eric ten Raa, reported that (Khoisan) Sandawe hunters once walked down to Dar es Salaam, learned how to sail an Arab dhow, then sailed to England and back, stopping finally in Australia. Once in 19th century Australia, a group of ‘aborigines’ learned to play cricket. They traveled to England where they defeated the local teams (ten Raa, 1962). For two archeologists’ critical view of this question, see Shea (2011) and McBrearty (2012). For the critical views of a physical anthropologist, see Landau (1984). We believe that Klein’s argument about head measurements in relation to intelligence or symbolic culture would **not** survive a rigorous ethnographic appraisal cross-culturally. We note that in the modern world the music and artistic bents of Ethiopia or Somalia and those of Nigeria or Ghana differ markedly.
- 3) Although the debate over whether a species or a subspecies best describes either Neanderthal or Homo sapiens sapiens, or both, is not settled, we prefer to regard both as **subspecies** of Homo sapiens. The key evidence: inter-breeding in Eurasia.

4) For tool kit continuity in Ethiopia, see Shea, Fleagle, and Assefa (2007). For the primary site in Ethiopia see McDougall, et al., (2005).

5) Further mtDNA studies have **confirmed Eve's dates** at around **200 kya**. See Soares, et al., (2009); Behar, et al., (2008); Gonder, et al., (2007); Mishmar, et al., (2003). For Australia, such studies indicate a coalescence time for both N- and M- lineages of around 66 kya, presumably in the north. Then the central desert by 48 kya and New South Wales by 40 kya. See Hudjashov, et al., (2007). There is also fossil H.s.s. at Lake Mungo, New South Wales, conservatively dated around 40 to 43 kya.

6) Specific sites are Klasies River Mouth, Blombos Cave, Abdur Reef, Taramsa 1, El Guettar, Skhul-Layer B, Qafzeh, Jebel Faya, Patpara. See Klein (1999) for tooth sizes of Aterian and other sites.

7) The difference between 'dispersion' and 'migration' can be readily seen in the movements of west Europeans into North America in the late 2nd millennium AD. Five distinct movements can be seen on one horizon, the European invasion of North America. Going from the north, we have (a) the **French** following the St. Lawrence into the northern interior, (b) the **Yankee** or Puritan going north of the Appalachians towards the Great Lakes, thence to Oregon and California, (c) the **Southern** or Cavalier going inland southeast of the Appalachians, bending west into Texas and the Southwest, (d) the **Appalachians** or **Scotch-Irish** following the Appalachian chain from Pennsylvania, ultimately to Texas, and (e) the **Spanish** or **Conquistador** movement, the earliest, moving across the Caribbean, thence to Mexico, thence north into the Southwest and south into Central and South America. This account is derived from the recognized history of European settlement in North America, combined with the same areas' known dialect geography.

Archeologically, the five movements contained highly similar but distinctive tool kits. Physically, the people were quite similar but with some distinctions, with small DNA differences. The languages were similar, indeed related, coming from one phylum, Indo-European. Within six centuries, this dispersion had occupied the whole continent, despite sometimes vigorous opposition from the autochthones, who were largely wiped out. There was some interbreeding with the natives, reaching significant percentages primarily in the Spanish realm, where the largest native populations are thought to have been. Early H.s.s. had 42 times as much time to occupy a much larger realm, but, of course, much less technological advantage over the autochthones, until the LSA period when the bow and arrow was added to the LSA tool kit (McBrearty, 2012).

8) We do not know exactly when language was invented or developed and we eschew all attempts to find out exactly when. We submit that such a question will have to wait upon the **reconstruction** of proto-Human before it can be answered. We doubt that the answers will be found in the **'hardware'**.

9) There is a clear consensus among Africanists that the original Pigmy speech was replaced by Bantu or Sudanic languages, which moved into the forests in the past 5000 years. Ten numbers of a language called Dima, spoken by supposed Pigmies in southern Ethiopia in the early 20th century (Conti Rossini, 1927) cannot be related to any other number set in Africa; these are the only known Pigmy language data, not created for tourists to wonder at. Further research by Bahuchet and his colleagues may be able to reconstruct some of the original Pigmy language from phonetic patterns and unusual lexical items.

10) See Bengtson and Ruhlen (1994). Support for them can be found in Pagel (2000). Very recent empirical support can be found in Matthey, et al., (2011) who argue that the vast global distribution of kinship terms like **[papa]**, **[mama]**, and **[kaka]**, usually for "father", "mother" and "uncle" or "grandparent" cannot be explained by theories of baby talk or spontaneous invention through the linguistic experimentations of children trying out the easily accessible sounds like **[m]**, **[b]** or **[p]**.

Rather these kinship terms can be most readily explained **historically**, as **products** of inheritance from proto-Human. Especially telling is the case of [kaka] type words which were not usually included in theories of baby talk.

11) Some debate whether UG is “**hardwired**” genetically in the brain or whether it is universal “**software**.” S. Pinker likens UG to a tool kit which a person uses to construct a grammar. However, UG has been denounced by many linguists and psycholinguists for being too nebulous, too dogmatic, and not in fact universal. See Evans and Levinson (2009), especially a contribution by M. Tomasello. The critics, nevertheless, explicitly include Australian and Papuan languages in examples of human language behavior.

12) Analogously, another indication of diversity equaling greater age appeared in the case of frogs in the Amazon. Where the argument was

“Diversity Takes Time”

“Like many groups of organisms in the Amazonian tropical rainforest, hylid tree frogs show a very high diversity. Moreover, there is strong variation in local diversity, with some localities and regions having much higher density of species than others. Wiens, et al., (2011) take a phylogenetic approach to the question of the cause of this local variation. Their analysis indicates that there is little or no relationship between variation in local species richness and climate variables such as temperature and precipitation. Nor are the rates of diversification or morphological variation correlated with local richness. Instead, diversity is related to the length of time that hylids have occupied a region. Even though diversification rates slow down when multiple clades occupy a region, species nonetheless continue to accumulate with the length of time that the region has been occupied. The highest diversity occurs when the largest number of clades have coexisted for longest.” For the tree frogs see Sugden (2011).

13) See Kruskal, et al., (1973). As calculated by the most ‘liberal’ or the system with the oldest dates. Other systems and the standard original one yield 10 ky to 20 ky at one per cent (1%) retention. At zero percent (0%), which is reached in some African phyla, chronology becomes impossible. Glottochronology is comparable to radiocarbon dating in its chronology. A similar system was invented by the Russian linguist, Sergei Starostin, who has a shallower chronology. Taxonomically useful evidence may still be abundant at the zero to one per cent level, e.g., morphological, phonological, or core lexical evidence. Such occurs between Omotic and Semitic languages in Afrasian or between West Atlantic and Adamawa-Eastern in Niger-Congo. For example, Semitic Geez [nage] and [noge] = ‘elephant’ and [nagot] = ‘trunk’, while in Omotic Dime [nuku] = ‘nose’. These cognate terms would be scored as negative on a Swadesh glottochronological list because Geez has a different term for ‘nose’, while Dime has a different word for ‘elephant’. Or Ancient Egyptian has [s-n] for ‘smell’ while Omotic Basketo has [sin-ts] for ‘nose’. Again, two cognate terms, but not on the glottochronological list, where the Egyptian word would be [f-n-d], a non-cognate word, despite much similarity of consonants. See Semitic Amharic [afinč’a] ‘nose’ for the cognate to the Egyptian form.

14) We mention one attempt at calculation in Austric. As reported by Isidore Dyen (1965), one of the Austronesian primary branches on Formosa (possibly Paiwanic) scored 6% of retention compared with a Melanesian language of the Oceanic division of Eastern Malayo-Polynesian of the Malayo-Polynesian branch of **Austronesian**. These are probably maximally divergent for Austronesian, one of two branches of Austro-Thai, itself one of the primary branches of Austric. That is reckoned as about 9000 years by the Joos system, reported by Greenberg (1987, p.342), or from **12,250 to 17,150 (avg. < 15 kya)** by Kruskal, et al.’s tables (1973, p.36). The overall average would be ~ **12 kya**. And it would be a candidate for the date of proto-Austronesian. Then proto-Austric would be much older than that. Incidentally, at an equal percentage of retention these

figures would be likely to date proto-Pama-Nyungan in Australia which came to occupy most of Australia. (Calculations by Geoffrey O'Grady.)

15) See Greenberg (1995): nearly all 70+ languages of Ethiopia, Eritrea, and Somalia belong to Afrasian (Afroasiatic). The few exceptions are Nilo-Saharan languages along the western borders with the Sudan. Not only have scholars for centuries linked Ethiopian languages to those of the Near East and Egypt, but also the Borean hypothesis postulates them as the anchor of the Borean phyletic chain. Greenberg's concept of "valid taxon" is perhaps inappropriately named. It means that a taxon is formed when all members are closer to each other than they are to others. It corresponds to the concept of "monophyletic group" in biology. Thus, English, Dutch, and Swedish form a valid taxon for this reason: three Germanic languages. But English, Swedish, and Hindi also form a valid taxon for the same reason but at a higher level, Indo-European. On the face of it English, Swedish, and Hindi do not form a valid taxon because Hindi is related to Gujarati and Kurdish before it is related to Swedish and English. In mammalian terms, whales, orcas, and dolphins form a valid taxon but whales, orcas, and tigers do not because tigers belong with other cats. But in relation to sharks, all three form a valid taxon as mammals.

16) See Fleming (2002). This paper was also presented as a poster at Cold Spring Harbor Laboratory in October, 2002 and in a paper in *Mother Tongue, the Newsletter* (1991). Others later proposed a Borean with Austric added to it but without Amerind. See Gell-Mann, Peiros, and Starostin (2009). That in turn was similar to an earlier Russian version by A.Y. Aikhenvald-Angenot and J-P. Angenot (1989, 1992), which was circulated informally but published in *Mother Tongue: The Newsletter*. The theory, called NOSCAU, portrayed Austric as the third of three coordinate branches of NOSCAU, thus suggesting that Austric shares a common ancestor with the other two branches. There is no indication that Indo-Pacific, for example, was compared to Borean in this way. The NOSCAU proposal or Nostratic-Sino-Caucasic-Austric presented grammatical evidence, mostly pronouns. Most noteworthy was that neither Amerind nor Sumerian were included in NOSCAU, a serious difference with our Borean. It is possible that the authors did not try to link Amerind to the rest because they had not noted the very strong pronominal evidence linking Amerind and Afrasian, for example.

17) See Starostin (1988). Some additional Russian support for the Sino-Caucasic and Borean hypotheses can be found in Orel (1995). The Abstract says: "Basing on over 150 roots supposedly common to the three languages [sic], a rather simple set of consonant correspondences can be formulated. The name Paleolithic is proposed for the hypothetical proto-language." We believe that Borean at least is to be associated with the Upper Paleolithic (of Eurasia).

18) For example, within the prevailing "harsh" phonetics of **Semitic** languages there are those who altogether lack or have very few glottalics (or emphatics) or pharyngeals, e.g., Mesmes of Ethiopia, Maltese Arabic, and of course Modern Hebrew. In South Africa, Zulu and Xhosa with numerous clicks and glottalics contrast sharply with other Bantu languages: the reason is known to be close contact with Khoisan speakers. Pokomo, a Bantu language of eastern Kenya, also has a set of glottalic consonants, due to contact with Cushitic languages. In Egyptian, after 3000 years, there is a sharp difference between the early stages and the latest, with most of the "harsh" phones of the original being lost.

19) See P. Soares, et al., (2009), reported by James Harrod (2011). The problem of bio-genetic dating is **deeper** than they thought, however. See Ann Gibbons (2012) for a summary of recent research which has **re-set the biological clock**, so to speak, such that **most mtDNA dates** are **much older** than presently hypothesized. See A. Scally and R. Durbin (2012) for a primary discussion. Under the new clock Asians and Europeans diverge ~ **50 kya**, while Yoruba and non-Africans diverge at **110 kya**. However, one of their dates is simply unbelievable, i.e., they date the split between the **Khoe** (Hottentots) and the **San** (Bushmen) at >250 kya. **No Africanist could begin to**

accept that date! It is quite possible that their sampling picked up some Berg Dama or other divergent group (See Addenda, Part One). For another example, and a more satisfying one, Gibbons (2012) changes old dates of <70 ky to new dates of **90-130 ky** which fits our basic hypothesis and is much more in accord with fossil and archeological dates.

Apologia

A goodly amount of data are being published, or have been published in recent years, in the blooming field of **archeogenetics**. Some of this material has been incorporated in our article. We have had to forego mentioning many studies, not crucial to our hypothesis, lest we end up with a book. Our apologies!

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