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Linguistic stratigraphies and Holocene history in Northeastern Africa

For the whole of the Holocene, greater northeastern Africa has formed a zone of ongoing encounter between speakers of Nilo-Saharan languages and speakers of Afrasan (Afroasiatic) languages. The history of cultural change among each grouping of peoples and the history of inter-familial contacts over this long period left its mark in myriad ways in the vocabularies of the Afrasan and Nilo-Saharan languages. We can access the early eras of this history by laying out the linguistic stratigraphies of both families. With this base established, we can then situate the appearance of new vocabulary of subsistence (or other areas of culture) in the stratigraphy, according to when it first came into use. We can similarly identify the words adopted from languages of one family into languages of the other, situate the times and directions of the particular word borrowings within the stratigraphy, and seek out the cultural and sociolinguistic significance of different individual loanwords as well as sets of loanwords.

From these varied bodies of evidence several important conclusions emerge. The most important of all is that both families, the Afrasan (Afroasiatic) family as well as Nilo-Saharan, originated in Africa. This issue needs very strong emphasis, considering how widely scholars still hold the presumption that, somehow, Afrasan had an Asian homeland. This view has its roots in old, unexamined Western views about Africa. Much recent work in biological anthropology continues to start off with this presumption and, as a result, scholars too often still allow this view to shape, a priori, the interpretation of the DNA evidence.

A second discovery is that, from the very early periods, cultural and technological influences have flowed in both directions, from Nilo-Saharans to Afrasans as much as from Afrasians to Nilo-Saharans. In addition, the regions extending from the Red Sea westward along the line of climatic transition in the

central Sahara have formed a long-term zone of shifting language family boundaries and inter-familial influences. Finally, the areas between the Red Sea and the Nile have been especially affected by major episodes of population and language replacement over the course of the Holocene era. These findings have major implications for future work on the archaeology and the biological anthropology of the peoples of northeastern Africa in the Terminal Pleistocene and Holocene eras.

To uncover this history, we must first build linguistic stratigraphies for each family.

Afrasan Linguistic Stratigraphy and its Implications

On the African origin of the Afrasan language family

The cumulative work of many scholars on the historical reconstruction of the Afrasan language family, from Greenberg (1955) to very recent publications (Diakonoff 1998; Ehret 1999a, b), makes an overwhelming case for situating the origins of Afrasan, and nearly all of the history of the peoples who spoke languages of the family, in Africa (Ehret et al. 2004). Only Semitic, itself a relatively late offshoot of an otherwise African sub-branch of the family, has an Asian history at all.

The Africanness of the Afrasan family is evident first and foremost from a simple look at the geographical locations of the six universally recognized, deep divisions of the family. Three of the six are, in fact, not just African, but wholly sub-Saharan African. These are Cushitic, the languages of which are spoken from just north of the Ethiopian highlands to as far south as central Tanzania; Omotic, located entirely in the Ethiopian highlands; and Chadic, found far to the west, in the countries of Nigeria, Niger, Cameroon, and Chad. A fourth division, Berber, consists of languages of North Africa and the Sahara; a fifth, comprised of ancient Egyptian and its descendant form, Coptic, was spoken in the midst of the eastern Sahara. Just a single branch of the six, Semitic, is basically Asian.

Knowing the subgrouping of a language group allows us to make inferences as to the most probable location of the common ancestor language of the group as a whole. To do this we apply the principle of parsimony to the linguistic geography of the languages involved. We say that the best explanation for the locations of the languages in later times is the history that requires the fewest movement of peoples to account for those locations. Let us apply this principle to the six major divisions of Afrasan, one by one, and then to the family as a whole.

Cushitic divergence and history

Cushitic has four distinct subdivisions, Beja, Agaw, Eastern Cushitic, and Southern Cushitic (see list 1 for the particular languages of each). The view followed here is that these four distinctive groupings fall into two primary branches, one consisting of Beja alone and the other comprising Agaw and Eastern and Southern Cushitic (Hetzron 1982).¹ The evidence of shared phonological innovation strongly indicates that Eastern and Southern Cushitic form a combined, tertiary East-South Cushitic branching (Ehret 1987). The overall scheme of Cushitic relationships can be depicted as a tree:

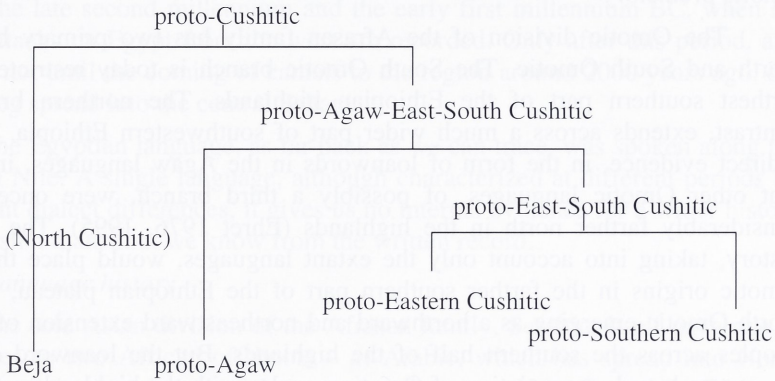


Figure 1. Family Tree of Cushitic Sub-branch of Afroasiatic

Applying the principle of parsimony of explanation, the simplest and most straightforward accounting of early Cushitic history depicts a successively southward advance of Cushitic speakers in four major early stages. The original Cushitic speech territory lay in either of two adjacent areas, the southern Red Sea hills, where the Beja have long resided, or the northern edges of the Ethiopian Highlands, where the lands of the rest of the Cushites begin. The proto-Cushitic society diverged into daughter societies either because the distant ancestors of the Beja moved northward into the Red Sea hills or because the ancestors of the proto-Agaw-East-South Cushitic community spread southward along the

¹ Some scholars have gone so far as to remove Beja entirely from Cushitic, but the shared innovative evidence in lexicon makes the case for its membership in Cushitic a solid one (e.g. Ehret 1987).

northern edges of the highlands. At the second stage, the proto-Agaw-East-South society itself diverged into two daughter societies. The proto-Agaw emerged in the far northern Ethiopian highlands; the proto-East-South Cushites settled in more easterly parts of the highlands, probably especially moving south along the Ethiopian rift valley (Ehret 1976). Finally, the Southern Cushitic offshoot of the proto-East-South Cushites moved still farther south, into Kenya and eventually Tanzania. Archaeological correlations show that the Southern Cushitic stage of this expansion, into Kenya, began in the mid- or later fourth millennium BC (Ambrose 1982), so the earliest stage of Cushitic expansion could lie as much as several thousand years earlier than the fourth millennium.

Omotic prehistory

The Omotic division of the Afrasan family has two primary branches, North and South Omotic. The South Omotic branch is today restricted to the farthest southern part of the Ethiopian highlands. The northern branch, in contrast, extends across a much wider part of southwestern Ethiopia. There is indirect evidence, in the form of loanwords in the Agaw languages, indicating that other Omotic languages, of possibly a third branch, were once spoken considerably farther north in the highlands (Ehret 1976, 1995). The simplest history, taking into account only the extant languages, would place the proto-Omotic origins in the farther southern part of the Ethiopian plateau, with the North Omotic emerging as a northward and northeastward extension of Omotic peoples across the southern half of the highlands. But the loanword evidence suggests a broader association of Omotic peoples with the highlands as a whole at a still earlier point in time.

Chadic, Berber, and Egyptian Language History

The Chadic languages today cover a large expanse of territories running across the southern parts of the Lake Chad basin in the central Sudan belt of Africa. Scholars who have worked closely and extensively with these languages divide them into either three or four primary branches (Newman 1977; Jungrauthmayr and Shimizu 1981), spread out east to west across this expanse of lands. Either subclassification depicts essentially the same broad history. The proto-Chadic language was spoken most probably somewhere in the areas west and southwest of modern-day Lake Chad. At the proto-Chadic period, on the order of about 7,000 years ago, a much vaster Lake Mega-Chad occupied the heart of the basin. The initial period of Chadic divergence into either three or four daughter societies would have spread Chadic communities all across the areas immediately west and south of that lake, from the plains north of the Jos Plateau on the west, to the Mandara Mountains in the middle, to as far east as the Guerra Mountains.

The Berber languages at the earliest stage of their so far traceable history were most likely spoken in central North Africa. Two different eras of major Berber expansion can be discerned from the linguistic record (Ehret 1999a, b). The earliest stage spread the ancestors of the Znaga to the western Sahara and of the Kabyle to northern Algeria, with the ancestral speech community of the remainder of the Berbers, which we might call the proto-Libu (i.e., Libyans), taking shape in some other part of central and western North Africa. An eastern outlier of this period of Berber expansion is likely to be reflected in the Middle Kingdom Egyptian records of warfare with peoples who attacked from the west around the close of the third millennium BC. The second period of Berber expansion, involving peoples of the Libyan grouping of Berbers, lay probably in around the late second millennium and the early first millennium BC, when renewed attacks on Egypt from the west are recorded. Only after this period, and possibly not until the coming of camels to the region around 2000 years ago, did the Tuareg spread into the central Sahara.

The Egyptian language, as far back as we can trace, was spoken along the Egyptian Nile. A single language, although characterized at different periods by significant dialect differences, it gives us no internal evidence for a wider history of expansion than what we know from the written record.

Semitic language history

The sole Asian division of the Afrasian family, Semitic, itself gave rise in later times to two African offshoots – a) Arabic, which has spread into North Africa, the Sahara, and parts of the eastern Sudan since 638 AD; and (b) Ethiopic, a group consisting of about 15 languages spoken today in Ethiopia and Eritrea, which all derive from a South Arabian language brought into the northern Ethiopian highlands in about the sixth and fifth centuries BC (Fleming 1968; Ehret 1988).² But the original split in Semitic was a dual one, separating Eastern Semitic, consisting of Akkadian in all its versions, from Western Semitic, comprising all the rest of the branch (Hetzron 1974, 1975).³ The subclassification of Semitic into Akkadian (Eastern) and Western branches locates its original center of divergence in the ancient period along a line that fell between Syria-Palestine and northern Mesopotamia. The most parsimonious history of Semitic has two alternative forms:

² Some scholars have offered impressionistic assertions that the proto-Ethiopic language might have been spoken in the Horn well before the sixth century, but Ehret 1988 and Fleming 1968 both have shown that there is no good reason to think that this Semitic offshoot reached there much if at all earlier than the epigraphic records indicate.

³ There remain alternative views to Hetzron's on how Western Semitic diverges, but his arguments and data continue to make a more compelling and—and this is crucial—a more comprehensively integrated case than any competing view.

(1) Proto-Semitic was spoken in northern Mesopotamia. Its speakers broke into two speech communities when one of those communities, ancestral to the Western Semites, moved away westward into Syria-Palestine.

(2) Proto-Semitic was spoken in Syria-Palestine. Its speakers broke into two speech communities when one of those communities, ancestral to Akkadian, moved away eastward into northern Mesopotamia.

Because of the many indications that non-Semitic languages predominated in Mesopotamia and all around its northern and eastern flanks in the pre-state eras – and that Akkadian therefore was originally intrusive to that region – the second solution seems by far the more probable of the two. The Syria-Palestine regions, as the part of Asia nearest and more directly connected to Africa, also make much better sense as the proto-Semitic territory, considering the solely African locations of all the rest of the Afrasan family. If it is eventually confirmed that the early Byblos language belongs to the eastern branch along with Akkadian, this would further consolidate the case for an original Syria-Palestine homeland for proto-Semitic.

Locating proto-Afrasan

So the linguistic geography of the Afrasan languages as a whole is resoundingly African. Even if the six major divisions of the family – Omotic, Cushitic, Chadic, ancient Egyptian, Berber, and Semitic – formed coequal primary branches of the family, each equidistantly related to each other branch, an inherently improbable situation – the inference of an African origin for the family would be overwhelmingly supported. An African homeland would more than meet the requirement of parsimony in such an instance: just a single population movement out of Africa would be required to account for the distribution of the branches. If an Asian origin were postulated, on the other hand, an immensely improbable five separate movements of peoples, all through one narrow isthmus or across the Red Sea to Africa, would have to be postulated.

The only basis on which the hypothesis of an Asian origin for Afrasan could be entertained would be a subclassification in which Semitic formed one of two primary branches of the family, and the other branch included the whole rest of the family. The old name Hamito-Semitic on the surface might seem to imply such a division. But no one who has worked widely on the family any longer considers this idea even remotely likely. The wide acceptance nearly everywhere today, even among the majority of Semiticists and Egyptologists, of the names Afroasiatic or Afrasan for the family came about because of the general recognition that Semitic does not constitute a primary branch all by itself and that the family is primarily an African one.

But the problems with an Asian origin for the family are far greater than even these considerations might suggest. Different lines of investigation – based on grammar, lexical innovation patterns, and a mix of grammatical and lexical evidence – have led several scholars separately to the conclusion that there actually is a particular division of Afrasan which may indeed form a primary branch of the family all by itself. That group is Omotic, the division of Afrasan located farthest south in Africa, in terms of the overall distribution of its languages, of any of the six divisions (Fleming 1969, 1983; Bender 1975; Ehret 1980). We now have available, in addition, a proposed overall classification of the interrelationships of the six divisions, based on the history of sound change in the family and backed up by further evidence of pronominal, lexical, and grammatical innovation. Again according to this classification, Omotic stands off from the rest of the family (Ehret 1995).

I. Omotic

(phonology: merging of proto-Afrasan (PAA) labiovelars with velars except before vowel *i; asymmetrical devoicing of two PAA voiced affricates (*j > *c, *dz > *ž); pronouns: innovation of *ta/*ne 1st/2nd person singulars)

II. Erythraic

(phonology: merging of PAA voiced and voiceless affricates into a single voiced and a single voiceless consonant; development of co-occurrence constraint disallowing two different labial consonants in same root; grammar: change to the marking of grammatical gender in nouns in place of only natural gender in PAA; pronouns: innovation of new masc./fem. 3rd person singular pronouns, of a new 3rd person plural pronoun, and of new 2nd person subordinate pronouns)

A. Cushitic

(phonology: PAA *b > *m preceding *n as the 2nd consonant in a root; unusual rule, devoicing of PAA *g to *k following *d or *w in the same root)

B. North Erythraic

(phonology: reduction of the vowels from a system of ten long and short vowels [*i, *ii, *e, *ee, *a, *aa, *o, *oo, *u, and *uu] to a system of one back, one front, and three central vowels [*u, *i, *a, *· and *i])

1. Chado-Berber

(morphology: innovated pronoun shapes [Newman 1980])

2. Boreafrasan

(phonology: development of extensive array of co-occurrence constraints against any sequence of sibilants in the same root; collapsing of velar and palatal nasals with *n; loss of lexical tone; grammar: shift of any still productive verb extensions from stem-final to stem-initial position)

Figure 2. Outline Classification of Afrasan (Afroasiatic) with Diagnostic Innovations

The subclassification of the Afrasan (Afroasiatic) family has the above outline (fig. 2). The version presented here has been recently undated (on the basis of Newman 1980 in combination with as yet unpublished new findings). Summary notes on unique innovations supporting each branch, sub-branch, and sub-sub-branch accompany the outline:

A tree of the proposed Afrasan branch relationships involved here provides a clearer sense of its historical implications (fig. 3):

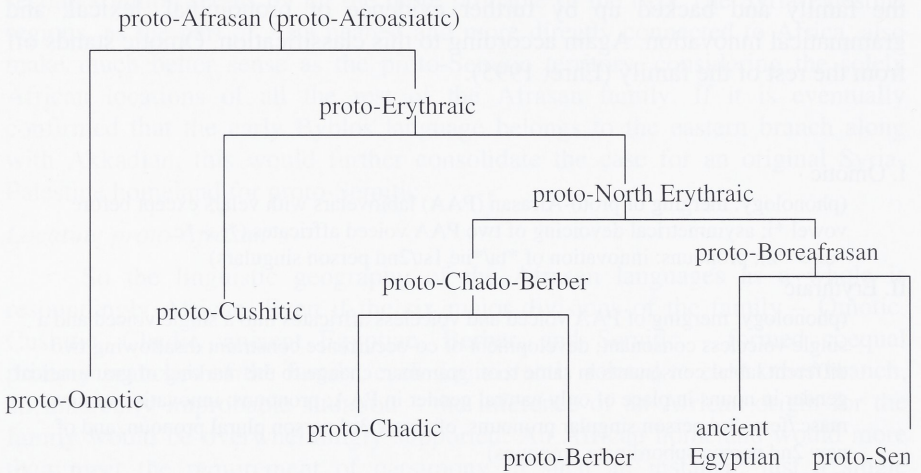


Figure 3. Family Tree of Afrasan Branch Relationships

The history implied by this linguistic stratigraphy begins with the proto-Afrasan speech community inhabiting a region no farther north than the southern half of the eastern Sahara. The primary divergence between Omotic and all the rest of the family allows two equally probable histories. One history places the proto-Afrasan community in the Ethiopian highlands. Afrasan then diverged into two branches, one ancestral to Omotic and a second, Erythraic, whose speakers spread northward into the areas of Africa west of the Red Sea. Alternatively, the proto-Afrasans initially lived immediately north of the Ethiopian highlands, and the ancestral Omotic society then diverged from the proto-Erythraic community by moving south into the highlands.

The overall scheme of relationships requires that at later periods the Erythraic peoples commenced a series of successively wider expansions, while the Omotic speakers remain restricted to Ethiopia. The Cushitic relationship tree (Figure 1) indicates that the Cushitic peoples spread by stages farther south through the Horn of Africa. The proto-North Erythraic speakers in contrast moved northward, most probably to the areas surrounding Egypt, diverging subsequently into proto-Boreafrasan and proto-Chado-Berber. Early Chado-Berber speakers, from the modern language distributions, would have emerged by an expansion westward across the Sahara. The subsequent resettlement of one branch of Chado-Berber southward accounts for the Chadic languages of the Chad Basin. The Berber languages derive from the Chado-Berber languages that continued to be spoken across North Africa. Boreafrasan also gave rise to two groups of people. One descendant group would have remained in the Egyptian regions and evolved into the later ancient Egyptians. The other group of early Boreafrasan speakers would have moved at some point across Sinai into the Levant; their descendants in language would have been the Semitic speakers of the past 6,000 years.

Future work may well revise or overturn parts of this picture; other parts are likely to last. The strongest claim here is that Omotic and Cushitic are indeed the two earliest divergences within the family. The evidence is pervasive that Egyptian, Semitic, Berber, and Chadic are significantly closer related to each other than they are to either Cushitic or Omotic, and that Omotic above all, and Cushitic to a lesser extent, stand off from the rest of the family. What this means is that the most probable lands of the proto-Afrasans lay not just in Africa, but specifically either in the southeasternmost parts of the Sahara, along the west side of the Red Sea, or farther south, in the Ethiopian highlands.

Dating Early Afrasan History

There is another kind of evidence, cognate counts in a 100-meaning list of basic vocabulary, that can be brought to bear on the problem of Afrasan subclassification and history. It is not determinative evidence by itself, and in any case the time depth of differentiation within the Afrasan family is so great that the rates of lexical retention between languages of distant branches of the family are exceedingly low. Nonetheless, these data conform roughly in their indications to the other evidence of subclassification. Most important, they bring us to an abrupt awareness of just how long ago the proto-Afrasan language must have been spoken.

A sample of lexical retention counts is provided here, drawing on the evidence of several languages from each of the major divisions of the Afrasan family. To give some reflection of the degree of diversity within each division, the languages were chosen from distantly related subgroups in each.

Because the Afrasan figures are so low, two points need special emphasis. First of all, the determination of what is cognate and what is not is based on the rigorous establishment of regular sound correspondences across the family (Ehret 1995). Neither impression nor guesswork is involved here. In addition, the knowledge of the regular correspondences allows one to avoid counting word borrowings as if they were true cognates. Failure to separate out borrowings can lead to a false inflation of the scores of Arabic with many of the Berber languages and of those between a number of the Cushitic and Omotic languages.

Ari (South Omotic)											
8	Mocha (North Omotic)										
1	0	Iraqw (Southern Cushitic)									
2	1	8	Cadale Soomaali (Eastern Cushitic)								
0	1	2	10	Yaaku (Eastern Cushitic)							
1	2	6	9	5	Awngi (Agaw Cushitic)						
1	2	4	7	5	7	Beja (Northern Cushitic)					
0	0	2	0	2	1	0	Ngizim (West Chadic)				
0	1	1	1	1	1	1	9	Matakam (Central Chadic)			
0	1	1	1	1	1	0	7	5	Tuareg (Berber)		
0	1	1	1	1	1	0	6	5	30	Kabyle (Berber)	
1	2	3	2	1	2	2	3	3	6	5	Middle Egyptian
2	2	2	2	1	2	1	3	4	4	3	6 Sudan Arabic (Semitic)
2	3	1	2	1	3	2	3	4	3	3	5 26 Tigre (Semitic)

Figure 4: Matrix Sample of Representative Afrasan Cognate Retention Figures

Secondly, the reader needs to know just what it is that this kind of lexicostatistics does count (fig. 4). The focus of the exercise is not simply the counting of cognates, as many works seem to imply, but rather the counting of a particular category of cognates, namely, lexical retentions. What one counts up is the number of times, in the 100-meaning list, in which a pair of related languages have retained the very same root word with the very same meaning ever since their earliest ancestor languages diverged out of their common proto-language. In both Ari of the Omotic branch and Iraqw of the Cushitic branch, for instance,

well over half of the items on the 100-meaning list can be traced back to proto-Afrasan roots (Ehret, MS), yet only one of the 100 has retained its original meaning down to the present in both languages. The rest have changed their meanings over the millenniums since the proto-Afrasan period – so far in the past did that period lie. The direct cognate, for example, of Ari word *gooli* “tail,” an item on the 100-meaning list, is Iraqw *gwalay* “female genitals,” different in meaning although clearly the same root.

One caveat: the Egyptian figures come from a version of the language spoken almost 4,000 years ago, so that it had less time for lexical change than the other cited languages, all of them spoken today. For this reason the Egyptian cognate retention counts are skewed higher with the other languages than if we had a modern-day descendant of Middle Egyptian to draw our data from. In particular, if we adjust our figures to account for this time difference, the Middle Egyptian percentages of cognate retention with Chadic, Berber, and Semitic drop down to around 2 per cent, and with Omotic and Iraqw, down to an average of 1 per cent.

We can better view the implications of this sample if we extract from it the ranges of cognate retention between the various deep divisions of the family. In this matrix we give the Middle Egyptian figures, as adjusted to account for the fact that those figures come from 4,000 years ago rather than from the present (the adjusted numbers are marked with asterisks; fig.5):

Omotic					
0-2	Cushitic				
0-1	0-2	Chadic			
0-1	0-1	5-7	Berber		
1	1	2*	2*	Egyptian	
2-3	1-3	3-4	3	2-3*	Semitic

Figure 5: Adjusted Inter-Group Median Percentages of Cognation Retention

The figures between the deep divisions are too low and close together to allow a detailed hierarchy of relationships to emerge, such as can be argued from other kinds of evidence. But taken at face value, they do reveal one thing: three distinct levels of Afrasan relationships appear in the numbers. Chadic and Berber share distinctly more lexemes in the basic list, confirming the probability of their forming a Chado-Berber sub-branch of North Erythraic (see outline and tree of relationship above). Chado-Berber, Egyptian, and Semitic divisions fall in the next range, with their figures with each other no lower than two per cent. Cushitic and Omotic appear consistently more distant, both from each other and

from the combined Chadic-Berber-Egyptian-Semitic branch, with their percentages of shared retentions of the same proto-roots with the same meanings running, in the great majority of cases from zero to two per cent. The Semitic languages chosen for the sample tend to run about a percentage point higher across the board with the other groups, so that figures as high as three per cent between Tigre and Omotic and Cushitic can be found. But the pattern is nevertheless preserved.

The lexical retention counts, in other words, conform to the conclusion reached from other, better kinds of evidence – that out of the earliest periods of divergence of Afrasan there arose three deep divisions of the family, Omotic, Cushitic, and North Erythraic (Chadic-Berber-Egyptian-Semitic). Just one branch, North Erythraic, then gave rise to languages to all the languages the northern half of the Sahara. Once again, the evidence strongly places Afrasan origins and the first stages of differentiation within the family no farther north than the southern half of the eastern Sahara.

The most striking insight these data give us, however, is that the proto-Afrasan language must have been spoken a great many thousands of years ago. Consider the Indo-European family: the percentages of cognate retention in the 100-meaning list between its most distantly related, modern spoken languages center around the middle and high teens, with one language, Armenian, dropping lower because of the numerous non-Indo-European loanwords in its basic vocabulary, to around 10 per cent with the rest. The most commonly accepted archaeological correlations date the early Indo-European society to around the fourth millennium BC or somewhat earlier.⁴ The retention counts between the most distant Afrasan languages, far lower, at 0-3 per cent, must therefore surely reflect a time span thousands of years longer than proto-Indo-European's generally accepted 6000 years. Just how many thousands of years is an issue one can dispute. But if, just for the sake of argument, we treat the formula used in glottochronology as if it made sense so far back in time, we discover that figures of 0-3 per cent, with a median of about one or two per cent, should correspond to a time span of somewhere in the range of 15,000 years between the time the proto-Afrasan language was spoken and now.

⁴ The only alternative claim, originated by Colin Renfrew, ties Indo-European to the first spread of agriculture into Europe 2000 to 3000 years earlier than that. This possibility is flatly contradicted by the evidence of the reconstructed proto-Indo-European vocabulary of technology (wheels, horses) and agriculture and by the evidence of pre-Indo-European substrata in each of the European branches of the family. These substrata include borrowed non-Indo-European words relating to agriculture, directly demonstrating that Indo-European languages spread into regions where farming was already established.

Linguistic Stratigraphy, Subsistence, and Dating

But we have a better and more direct way of establishing time spans of linguistic history. We can work out the linguistic stratigraphy of early Afrasan subsistence practices, and we can compare those findings to uncover plausible archaeological correlations. The basic framework of a linguistic stratigraphy is provided by the subclassification (fig. 6) of the family (see also the tree of relationship above):

- I. Omotic
- II. Erythraic
 - A. Cushitic
 - B. North Erythraic
 - 1. Chado-Berber
 - a. Chadic
 - b. Berber (Amazight)
 - 2. Boreafrasan
 - b. Egyptian
 - c. Semitic

Figure 6: Outline Classification of Deep-Level Divisions of Afrasan

Were the Early Afrasans Cultivators?

What sequences of subsistence developments took place among early Afrasan speaking peoples? At the proto-Afrasan period, a substantial body of root words (as reconstructed in Ehret 1995, Ehret MS, and Orel and Stolbova 1995) shows the earliest Afrasan communities to have utilized grasses and/or grains for food (table 1).

Table 1: Proto-Afrasan and proto-Erythraic Subsistence

1. *maa “grain” [Omotic: Mocha *maqwo* “cereals”; Cushitic *maay “grain; hard particle” (So. Cush. “granary”); Chadic: E. Chadic *may “sorghum”; Egyptian *mymy* “seed corn of emmer (?)”; Semitic *my “grain, seed grain, whole grains”]
2. *t’eff- “grain” [Omotic: Gonga *t’epp- “wheat”; Cush: Agaw *tab-/taf- “t’ef”; EC: Soomaali *dheef* “food, sustenance”]
3. *ʕeyl- “grain, cereal” [Omotic *il- “flour”; Cushitic *ʕeyl- “grain, cereal”; Egyptian *inyt* “kernels”]
4. *ḥaw-/*ḥay- “grain (gen.)” [Cushitic *ḥay- “grain (gen.)”; Chadic: Ngizim *āw* “grain (gen.); Egyptian *ḥw* “food”]

5. *buz- “flour” [Cushitic: Soomaali *budo* “flour”; Chadic: Bole *budu* “flour”; Omotic: Gonga *buddino “flour” is a probable loan from Cushitic]
6. *dzayj- “(coarse?) flour” [Omotic (Bench *žaču* “millet flour”); Egyptian *zww* “dust”; Semitic (Arabic *jadīd* “coarse flour”)]
7. *baayn- “grindstone” [Omotic; Chadic; Egyptian]
8. *-xuum- “to separate ears of grain” [Omotic: *Zays huum*- “to winnow”; Egyptian *hms* “ear of wheat” (Coptic *hms, hēms*)
9. *k^waʔ- or *-k^waaʔ- “grain (coll.)” [Cushitic: So. Cush.: Kw’adza kw’aʔateto “granary” (stem plus So. Cush. n. suffixes); Egyptian *ḳ33* “grains (?)”]
10. *zar- “grain, grass seed” [Omotic *zar- “seed”; Chadic (Ngizim *?ari* “grain with bran removed”); Semitic: PS *zrʔ “to sow; seed”]
11. *boor- “grain sp.” [Cushitic: Dullay *boor-t- “barley”; So. Semitic *br(r) “corn, wheat” (A. *burr*)]
12. *dar- “sorghum (?)” [Omotic: Chara *dara* ; EC: Afar *daro* ; Berber: Tamazight *ɔddə ra* “corn” (root *dər-, with unexpected vowel outcome, however)]
13. *muš-/miš- “kind of grain” [Cushitic *mušʔŋ-/mišʔŋ- “sorghum”; Egyptian *msy* “kind of grain”]
14. *daadl- “grain sp.” [Cushitic: Oromo *daad’a* ; Egyptian *dḏ*]
15. *ʕaag- “grain” [Cushitic: PSC, Beja; Egyptian; Chadic: Ngizim]
16. *baz- “grain” [Cushitic: PEC *baz(z)- “flour”; Egyptian *bdt* “emmer, spelt”; Semitic: Arabic *bazr, bizr* “seed, grain”]
17. *sowʔ- “grain, cereal” [Cushitic: Highland East Cush. *soʔ- “barley”; Chadic *səw- “sorghum”; Semitic *səʕ(ʔ) “wild grain” (Arabic “vetch; wild wheat”)]
18. *puzn- “loaf” [Cushitic: HEC, Oromo *budden- “flat bread”; Egyptian *pzn* “a loaf”]
19. *faʕ- or *faaʕ- “cooked grain” [Cushitic: So. Cush. *faʕ- “porridge”; Egyptian *pct* “a cake or loaf”]

Two other of terms of reference to the subsistence use of grains can be reconstructed to the ancestral North Erythraic language:

Table 2: Additional Grain Subsistence Terms in proto-North Erythraic

20. *ʕunz- or *ʕ^winz- “sp. of grain” [Chadic: Hausa *gundu* “Pennisetum” (Chadic *ʕ > Hausa /g/); Egyptian *hnd* “kind of cereal”]
21. *ɬaw “grain (coll.)” [Chadic: some C. Chadic *ɬaw “sorghum”; Egyptian *š* “garden”; Semitic: Arabic *šauna-t*, pl. *šawānī* “granary, barn” (< *ɬwn, stem plus *n n. suff.)]

But despite the size of this body of evidence, not one word certainly diagnostic of cultivation can be reconstructed for the early periods of Afrasan history. No words for a cultivated field and no words for tools specifically and only used in cultivation, such as the plow, appear in the data. A variety of verb roots of reference to digging can be identified, but none specifically and universally applies to cultivation.

One old Afrasan root, **-mar-* “to dig,” has been cited by various scholars as a candidate for such a verb of cultivation (notably Greenberg 1964). It gave rise to a proto-Chadic root word that distinctly meant “cultivated field.” But in the Semitic languages and Egyptian it occurs as a noun for a digging implement, either a hoe or a digging stick, a tool not diagnostic of farming because gatherer-hunters before the eras of agriculture also commonly used such digging implements. And above and beyond that problem, its Cushitic reflex, seen in the Southern Cushitic noun **mara?*- “burrow, den” (verb stem plus a Southern Cushitic noun-forming suffix **-V?*-), directly implies that the root originally applied to the digging of a hole and not to farming.

Alexander Militarev (2003) in a recent article has made the opposing claim, that the proto-Afrasans were food producers. There are two fatal problems with his arguments and data. The first is that the actual meanings of the reflexes he cites for each of his roots contradict his claim. The reflexes each include words that do have agricultural meanings in some languages or subgroups of Afrasan, but in each case the same roots have non-agricultural meanings in other languages, undermining the claim of reconstructed agricultural meanings for the roots. The second fatal objection is that Militarev’s proposed roots mostly can be shown not to be valid phonologically regular reconstructions. All but perhaps one of the purported roots are visibly composite in origin. That is, they combine into one root the reflexes of from two to as many as four or five distinct and separate early Afrasan roots (Ehret, forthcoming).

The complete lack of determinative evidence of cultivation in the early Afrasan strata contrasts sharply with the picture for later periods. In each of the proto-languages of the major divisions of the family root words distinctly indicative of farming occur. In the subgroups of deepest time-depth, the words are not numerous, but they consistently name aspects of cultivation. The proto-Cushitic language contained a verb meaning “to cultivate, till” and a noun for “cultivated field” (Ehret 1979, 1999a, b), while proto-Chadic had, as just noted, the word **mar* “cultivated field.” The subsistence vocabularies of the proto-Berber and proto-Semitic languages provide still stronger evidence that their speakers were indeed farmers (for Semitic, see Diakonoff 1981). (The proto-Omotoc vocabulary has not yet been adequately enough studied to include its data in the picture.)

To sum up, throughout the early stages of Afrasan history, the lexical evidence is exceedingly strong that grains or grasses played a key role in subsistence. At the same time, however, there is no evidence before the proto-Cushitic, proto-Chadic, proto-Berber, and proto-Semitic languages that these sources of food were anything but wild plants. The answer to the question asked by the title of this section seems to be, "no", the early Afrasans were not cultivators.

Were the Early Afrasans Herders of Domestic Animals?

But if the early Afrasan were not tillers of the soil, might they still have been raisers of livestock?

The diagnostic evidence for postulating herding is a little different in nature from that indicative of cultivation. Again the reconstruction of certain verb roots is important, including roots with such meanings as "to drive to pasture" and "to drive to water." And there is a herding noun equivalent to the term for "cultivated field," namely a word for "livestock pen." But in addition, the domestication of an animal can be identified from the existence of certain breeding terms. It is not enough to reconstruct separate words for the male and female of a particular animal, distinct from the generic term, because gatherer-hunter peoples often themselves make these distinctions for especially important meat animals. What is diagnostic of herding, however, is the presence of the particular breeding terms for "castrated male" and for "young female animal that has not yet born young" (e.g., heifer, Färse). Milking is another activity requiring domestication for its success. The diagnostic terms in this semantic field are verbs for "to milk" and nouns for such things as "sour milk," "buttermilk," and "butter." The noun "milk" is, of course, non-diagnostic by itself, as are also verbs with the meaning "to produce milk," since all mammals, including humans, make milk.

None of these several kinds of term diagnostic of livestock raising can be certainly reconstructed back to the early stages of the Afrasan family. Only at the proto-Cushitic, proto-Chadic, proto-Berber, and proto-Semitic stages, separately in each division, did such vocabularies come into certain existence. Proto-Cushitic, for example, had verbs for "to milk" and "to herd" and nouns for "sour milk," "heifer," "ewe-lamb," and "livestock pen," among others (Ehret 1987, 1999a,b).

But there is one other kind of evidence that can be diagnostic of herding, and that is the presence of terms naming animals that were domesticated elsewhere and were not native in their wild state to the areas where those terms are used. In the case of the Afrasan languages of Africa, such animals would be the goat and the sheep, both domesticated in far southwest Asia. A number of possible old Afrasan terms for goat and sheep have been proposed (Orel and

Stolbova 1995). Most of these turn out not to be valid reconstructions or to have more probably referred originally one or another species of antelope or other wild ungulate.

Nevertheless, after weeding out the inapplicable cases, a few terms do remain that consistently refer to either goats or sheep. We can divide them into two groups. The first group contains three terms that each very probably does derive from a single original root word, but fail the test of fully regular sound correspondence in either their vowels or their consonants. Their distribution in the Afrasan languages must thus be attributed to borrowing spread:

Table 3: Terms for Domestic Stock Widely Spread by Borrowing.

22. *book- or *boox- “he-goat” [Cush: Beja *book* “he-goat”; Chadic: PCh *bkr “he-goat,” Matakam *bɔx* “goat”]
23. *b-g- “sheep” [Cush: Agaw *bæg-; Semitic: Ethiopic *bəgg- is a loan from Agaw; Omotiic: Gonga *bag- is also a probable Agaw loan]
24. *gayd- “goat” [proto-Semitic *gdy “goat”; Berber *i-ɣayd “kid”; Berber *(a)-yat “goat” could be a separate borrowing of this same root]

Item 22 is a Wanderwort, having diffused from the Chadic languages of the Chad Basin as far south by 3000 BC as southern Cameroun, where it was adopted into the proto-Bantu language as *-boko “he-goat” (Ehret 1998: 105). It also appears in Indo-European: German *bock*, English *buck* “he-goat, male deer, etc.,” and Armenian *buc* “lamb.” Item 24, found in just the Semitic and Berber subgroups of the Afrasan family, seems similarly to have been a Wanderwort, with a northward expansion as well, accounting for proto-Indo-European *ghaido-“he-goat” (the source of the English word *goat*).

Table 4: Domestic Animal Terms of Uncertain History.

25. *ndzil- “ram” [Chadic: CCh *(n)zəl- “ram (?)”; Eg. *zr* “ram,” *zr:t* “ewe”]
26. *karr- “young sheep” [proto-Semitic *krr “male lamb”; Berber *-krärr -/*-krär = “sheep”]

The second group of such items (table 4) consists of just two roots, which, as far as we can tell (we lack evidence of the Egyptian stem vowel in item 25), do show regular sound correspondences throughout. Both refer to sheep. They may indeed demonstrate the adoption of sheep very early among North Erythraic people. An alternative explanation, however, better in keeping with the borrowing spread of the generic term *b-g- for “sheep” (item 23 above), is that

these two words dispersed, too, by borrowing, but in this case without happening to have left visible phonological evidence of that fact.

The latter of these two terms then spread farther south, where it was adopted into some of the Nilo-Saharan languages (Ehret 1993).

To sum up the evidence for livestock raising, there is no firm basis for thinking that the Afrasan peoples kept livestock in the early eras of their history. Several terms for goats and sheep have distributions that best fit with their having been terms that diffused from one Afrasan group to another along with the spread of those two animals from Asia into Africa, beginning by or before 6000 BC. But as was true for cultivation, the clear evidence for herding appears only at the proto-Cushitic, proto-Chadic, proto-Berber, and proto-Semitic periods.

Early Nilo-Saharan Language History

Stratifying Nilo-Saharan History

Having laid out the evidence for the early Afrasans, we proceed now to consider the Nilo-Saharan speakers and their roles in early northeastern Africa.

A recent, detailed Nilo-Saharan family stratigraphy has been published elsewhere (Ehret 2001). We present a simplified version of that stratigraphy here (Figure 7), with the lower-level internal subgroupings within the Central Sudanic, Koman, Saharan, Maban, and Eastern Sudanic divisions of the family left off. The dating scale along the right side of the chart rests on proposed archaeological correlations of the ninth to seventh millennia BC for the Northern Sudanic, Saharo-Sahelian, and Sahelian stages in the linguistic stratigraphy (Ehret 1993) and separately on correlations of developments of the last two millennia BC for the Nubian and Rub strata (Thelwall 1982; Ehret 1983, 1998, 2003a). The correlations of the ninth to seventh millennia seem, if anything, even more securely founded in the light of the most recent reevaluations of the eastern Saharan archaeology (Wendorf and Schild 1998, 2001). The intervening stages of Nilo-Saharan divergence have been given proposed rough dates in the stratigraphy according to their relative lexicostatistical distances (see Bender 1971, Thelwall 1982, Ehret 2000 for these figures). Question marks following these interpolated dates denote their lack as yet of proposed specific correlates in the archeological record. The dates, the reader will note, are not necessarily proportionally spaced along the righthand side, because of the necessity of fitting more salient nodes into the tree during some eras than in others.

Early Nilo-Saharan subsistence

The evidence for the timing of the emergence of food production is strikingly clear and consistent in the Nilo-Saharan stratigraphy. For the proto-Nilo-Saharan and proto-Sudanic stages, no food production can be reconstructed.

The proto-Northern Sudanic language, in contrast, contained vocabulary indicative of the raising specifically of cattle, along with lexicon requiring the use of grains as food, but not diagnostic of their having been cultivated. The succeeding stage, proto-Saharo-Sahelian, added vocabulary of cultivation along with lexicon indicative of more extensive cattle raising and also, for the first time, terminology descriptive of large, complex sedentary homesteads, including granaries and round houses. The still later period, proto-Sahelian, added further words to the agricultural and cattle-herding lexicon, as well as a set of words relating to goats and sheep (for these data, see Table 5 below).

The linguistically-attested steps in the shift of Nilo-Saharans to a food-producing economy are exactly those of the archaeology of the earliest cattle-raisers of the southern eastern Sahara between 8500 and the sixth millennium BC^o- first, cattle raising and ephemeral settlements; then, as of the later eighth millennium, larger more sedentary settlements with granaries and round houses and *prima facie* evidence of possible cultivation; finally, sometime after 7000 BC, the appearance of sheep and goats.

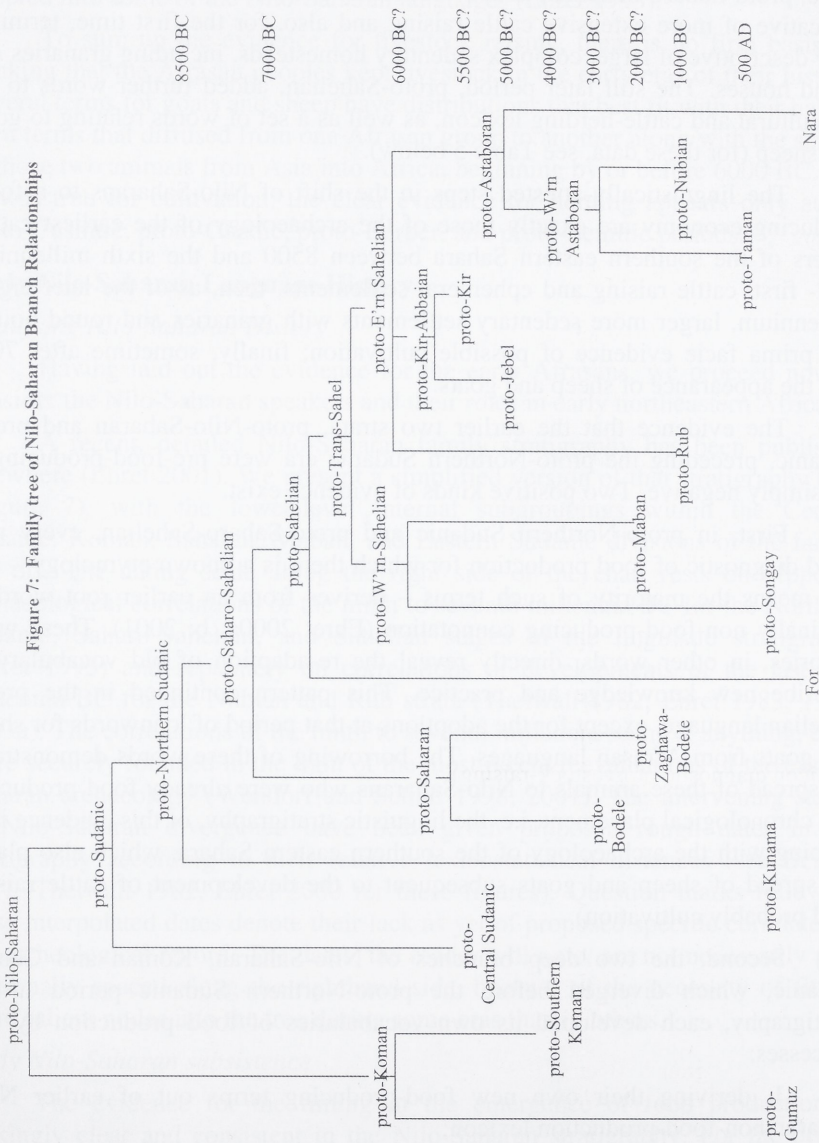
The evidence that the earlier two strata, proto-Nilo-Saharan and proto-Sudanic, preceding the proto-Northern Sudanic era were pre-food-producing is not simply negative. Two positive kinds of evidence exist.

First, in proto-Northern Sudanic and proto-Saharo-Sahelian, every root word diagnostic of food production for which there is a known etymology – and this means the majority of such terms – derives from an earlier root word of originally non-food-producing connotation (Ehret 2000a, b; 2001). These word histories, in other words, directly reveal the re-adaption of old vocabulary to describe new knowledge and practice. This pattern continued in the proto-Sahelian language, except for the adoptions at that period of loanwords for sheep and goats from Afrasan languages. The borrowing of these words demonstrates the spread of these animals to Nilo-Saharans who were already food producers. The chronological placement, i.e. the linguistic stratigraphy, of this evidence is in keeping with the archaeology of the southern eastern Sahara, which also places the spread of sheep and goats subsequent to the development of cattle raising (and probably cultivation).

Second, the two deep branches of Nilo-Saharan, Koman and Central Sudanic, which diverged before the proto-Northern Sudanic period in the stratigraphy, each developed its own vocabularies of food production by two processes:

1. deriving their own new food-producing terms out of earlier Nilo-Saharan non-food-production lexicon;

Figure 7: Family tree of Nilo-Saharan Branch Relationships



2. *borrowing* key food-producing words from descendant languages of proto-Northern Sudanic.

This latter kind of evidence reveals that the Koman and Central Sudanic development of food production rested on the prior creation of this kind of economy by the Northern Sudanians and their descendants.

For the proto-Sudanic period, preceding the Northern Sudanic era, a small set of data relating to the economy and technology of the proto-Sudanic period has been given tentative identification. It consists of three verbs, one meaning apparently “to grind (a tool)” and the others for “to grind (grain)” and “to heap up (especially grain),” and a very, very provisionally proposed noun for a jar or pot of some kind. These terms direct our attention to some of the things we might look for in seeking to identify the archaeology of the immediate pre-cattle-raising ancestors of the proto-Northern Sudanians. They may already have been collectors of wild grains or grasses and would already have been making ground stone tools, and they may possibly have been experimenting with pottery making (see Table 5).

Table 5: The Development of Nilo-Saharan Food-Production Vocabulary

Sudanic stage (uncertain space of time before 8500 BC)

1. *hī or *hih “to grind (grain)” [CSud; Kunama]
2. *we:y “to whet, grind (blade)” [CSud; Kunama; For; E’rn Sahelian (Kir-Abbaian [KA]; Daju, Nilotic)]
3. *piḏ “to gather (especially grain)” [CSud; Saharan; For; E’rn Sahelian (Astab: Nubian; KA: Nilotic)]
4. *DoS “water pot (?)” [CSud; Kunama] (this item is a very tentative proposal)

Northern Sudanic stage (9th/8th millennium BC)

(lexicon diagnostic of livestock-raising)

1. *nḏow “to milk” [Kunama; E’rn Sahelian (Astab: Tama; KA: Gaam; proto-Kuliak)]
2. *ṣu:k “to drive (domestic animals)” [Kunama; Saharan; E’rn Sahelian (Astab: Nubian)]
3. *ya:t “to water (livestock)” [Kunama; Saharan]
4. *se or *ṣe “grass used as fodder” [Kunama; Saharan]

(subsistence lexicon, non-diagnostic of food production)

5. *ya:yr “cow” [Kunama; Songay; E’rn Sahelian (Astab: Nara; KA: Gaam, S’n Nilotic)]
6. *Way “grain” [Kunama; For; E’rn Sahelian (Astab; KA)]
7. *ke:n “ear of grain” [Kunama; Songay]
8. *p’el “grindstone” [Kunama; E’rn Sahelian (KA: W’ern Nilotic)]

(lexicon of other material culture)

9. *sa:p *or* *sa:B “temporary shelter” [Kunama; Songay; E’rn Sahelian (KA: W’rn Nilotic)]
10. *ted “to make pot” [Kunama; Maban (Maba); E’rn Ssahelian (KA: W’rn Nilotic)]

Saharo-Sahelian stage (later 8th millennium BC)

(lexicon diagnostic of cultivation)

1. *dip^h “to cultivate” [Saharan; Songay; E’rn Sahelian (KA: Gaam)]
 2. *tɔ:k(ɔ:p) “to cultivate” [Saharan; Songay; E’rn Sahelian (Kuliak)]
 3. *tʰayp^h “to clear ground in cultivation” [Saharan; Songay; E’rn Sahelian (Rub; KA: Gaam)]
 4. *kʰay “to clear (weeds, stubble)” [Saharan; Songay; E’rn Sahelian (KA: Nyimang; W’rn Nilotic)]
 5. *dɔmp “cultivated field” [Saharan; E’rn Sahelian (KA: Temein; W’rn Nilotic)]
- (grain preparation lexicon, non-diagnostic)

6. *ɲak *or* *ɲaG “to grind (grain) coarsely” [Saharan; E’rn Sahelian (KA: W’rn Nilotic)]
 7. *p^heθ “to winnow” [Saharan; Songay; E’rn Sahelian (KA: Nilotic)]
- (other material culture lexicon: residential)
8. *boreh “thornbush cattle pen” [Saharan; E’rn Sahelian (Kuliak)]
 9. *kʰal “fence” [Saharan; Songay; E’rn Sahelian (KA: W’rn Nilotic)]
 10. *Dɔŋ “yard, enclosure of homestead” [Saharan; For; E’rn Sahelian (KA: Daju; E’rn Nilotic)]
 11. *dɔr “open area of settlement” [Saharan; E’rn Sahelian (Astab: Nubian; KA: Gaam, Nyimang, Nilotic)]
 12. *p’er *or* *per “granary” [Saharan; For]
 13. *dɔŋk’ol “circular roll of grass which supports roof of round house” [Saharan; E’rn Sahelian (KA: W’rn Nilotic)]

(additional livestock terminology, diagnostic of livestock-raising)

- (8. *boreh “thornbush cattle pen”)
14. *yokw “to herd” [Saharan; Songay; E’rn Sahelian (Kuliak; KA: Nilotic)]
15. *ŋget, ’ “to milk” [Saharan; E’rn Sahelian (KA: W’rn Nilotic)]
16. *t^ha “milk” (n.) [Saharan; E’rn Sahelian (Astab: Nara; KA: W’rn Nilotic)]
(derivation < PNS root for “white” implies milk in quantity, hence diagnostic of milking)

Sahelian stage (7th/6th millennium BC?)

(lexicon diagnostic of sheep and goat raising)

1. *ay “goat” [For; E’rn Sahelian (KA: Temein, Daju, Surmic)]
2. *ɟent “he-goat” [Songay; E’rn Sahelian (Kuliak)]
3. *Wer “sheep” [For; E’rn Sahelian (Astab: Nubian; Kuliak; KA)]
4. *meŋk^h “ram” or “sheep” [Maba (“sheep”); E’rn Sahelian (KA: Nilotic (“ram”))]
5. *Wel, “ram” [For; E’rn Sahelian (Kuliak; KA: Daju)]

6. *k'er "ewe-lamb" (?) [Songay ("female kid"); E'rn Sahelian (KA: Bertha, Temein, E'rn Nilotic)]
7. *ɕaw "lamb" (?) [Maban; E'rn Sahelian (Astab: Nara; KA: Nilotic)]
8. *θagw "young male goat or sheep" (?) [Songay; E'rn Sahelian (KA: Daju, Nilotic)]
- (additional cattle terminology)
9. *Tɛ or *Tɛh "cow" [Maban; E'rn Sahelian (Astab.: Nubian, Taman; KA)]
- (additional cattle terminology, diagnostic of cattle-raising)
10. *oWiŋ "bull" [For; E'rn Sahelian (KA: E'rn Nilotic)]
11. *ma:wr "ox" [Maban; E'rn Sahelian (KA: Kir)]
12. *yagw or yaɕw "young cow (heifer?)" [Songay; E'rn Sahelian (Astab: Nubian; KA: S'rn Nilotic)]
- (additional crop lexicon)
13. *uT "a kind of calabash" [Songay; E'rn Sahelian (Kuliak)]
14. *k^hul "a kind of gourd" [Songay; E'rn Sahelian (KA: Nilotic)]
15. *Kɛdeh "bottle gourd" [For; E'rn Sahelian (KA: Nilotic)]
16. *buɕ "edible gourd" [For; E'rn Sahelian (KA: Surmic, Nilotic)]
- (additional lexicon diagnostic of cultivation)
17. *p^had "to cultivate" [Songay; For; E'rn Sahelian (KA: S'n Nilotic)]
18. *t'um "to sow, plant" [Songay; E'rn Sahelian (KA: Gaam)]
19. *p^ha:l "bush, uncultivated land" [For; E'rn Sahelian (Astab: Nubian; KA: Nilotic)]
- (food preparation lexicon, non-diagnostic of food production)
20. *p'ent'uh "winnowing tray" [Songay; E'rn Sahelian (KA: W'rn Nilotic)]
- (other material culture lexicon: residence)
21. *hwe "house" [Songay; E'rn Sahelian (Kuliak; KA)]
22. *ka: or *ka:h "enclosure (for cattle?)" [Songay; E'rn Sahelian (Astab: Nubian; KA: S'n Nilotic)]

What have not been properly investigated as yet are the fish and fishing lexicons of early Nilo-Saharan. The little we can propose as yet about the material culture of the proto-Sudanic stratum allow the possibility that the proto-Sudanians were the instigators of the spread of the Aquatic economy of the tenth to eighth millennia across the Sudan belt. In this scenario the Northern Sudanians could be understood as an offshoot of the proto-Sudanic community that chose an alternative subsistence response to the changing climate of the era – adapted to the dry eastern Saharan areas away from the more favored river and lake environments where their sister peoples of the Sudanic branch predominated. In this way we could parsimoniously account for the shared pottery traditions and other features common to both the Aquatic peoples and the Eastern Saharan cattle-raisers.

Summing up the Linguistic Inferences on early Nilo-Saharan and Afrasan History

The Afrasans

The now very extensive evidence we have from the stratification of language history from greater northeastern Africa places two families of languages, Afrasan (Afroasiatic) and Nilo-Saharan, anciently in these regions. (There may well once have been other language families there, but if so their languages have all become extinct in the face of the expansion of these two families.) The presence of both these families goes back to pre-food-producing eras, well before 10,500 B.P.

The Afrasan family originated in all probability in either of two locations: in the northern Ethiopian highlands or in the areas immediately north of the Highlands. There is an interesting bit of supporting zoological vocabulary evidence for placing them in the Horn: their reconstructed lexicon shows that at the Erythraic stage of their history, they knew of the donkey, PAA *kwer-, and a second equine species, proto-Erythraic *for- (Ehret, MS). The second term denotes a zebra in Cushitic languages, but an onager in Semitic, so either meaning might seem plausible as the original. But in fact there appears to have been only one zone of with a high probability of early Afrasan settlement, in which two species of wild equine coexisted in the late Pleistocene, namely, the steppe climate areas of the northern and eastern Horn of Africa, where the territories of the wild donkey and the zebra overlapped.

The evidence of reconstructed subsistence lexicon shows that the proto-Afrasans and their Erythraic descendants must particularly have emphasized the collection of wild grasses and/or wild grains. Just this kind of economy was present in the Terminal Pleistocene in or near the regions where the linguistic arguments best place the proto-Afrasans. Wild grass collecting goes back before 15,000 BP in the Nubian Nile regions and has been claimed to be present in the same period around Diredawa on the northern edges of the Ethiopian highlands. What is lacking currently is knowledge of subsistence in the highlands themselves in the Terminal Pleistocene. But since this period was arid, with probably much more extensive areas of grassland in the highlands than in the early and mid-Holocene, it would not be at all surprising if we were to discover that wild grass or grain collection was practiced there as well.

The unassailable lexical evidence of food production among Afrasan peoples goes back only to the proto-periods of the major existing subgroups of the family, the proto-Cushitic, proto-Chadic, proto-Berber, and proto-Semitic periods. If we consider the chart of inter-branch Afrasan cognate retention percentages, the branch with the deepest internal time depth is Cushitic. The lowest

percentage range in Cushitic, representing the time since the first divergences within Cushitic took place, centers on a median of 5-6 per cent. The range of deepest cognation in Northern Sudanic, with a median slightly lower at around four per cent (Ehret 2000b), indicates that the proto-Cushitic period fell perhaps slightly later than proto-Northern Sudanic. If as the proposed archaeological correlations postulate, the proto-Northern Sudanic period lay in the ninth and early eighth millennia BC, then the proto-Cushitic period not unreasonably might be placed at around the eighth millennium. This datum implies that we should not expect the earliest archaeological evidence of livestock raising among Afrasans to go back much before 8000 BC.

Overall, four successive periods can be identified in the linguistic stratigraphy of the earliest periods in Afrasan history –

1. proto-Afrasan
2. proto-Erythraic
3. proto-North Erythraic
4. a. proto-Boreafrasan
4. b. proto-Chado-Berber

The reconstructed lexicons of subsistence in each successive stratum reveal the Afrasan peoples, all through these successive periods, to have possessed grindstones and made a strong subsistence use of grasses or grains, but there is no probative evidence at any of the periods indicating the cultivation of those plants. These stages of history, in this scholar's view, most likely belong to successive eras in the period between the last glacial maximum and 8000 BCE. I reach this conclusion partly on the basis of what I see as strongly plausible archaeological correlations for the initial breakup and expansions of the proto-Chado-Berber, stratum 4b in the linguistic stratigraphy, as argued in the next paragraph. If correct, these correlations would place the close of stage 4b in the ninth millennium BCE. The context of the prior divergence of the proto-Erythraic group, brought about by a spread of North Erythraic communities (stratum 3) northward toward Egypt, remains an issue. Possibly the proto-North Erythraic group followed the Nile corridor north; possibly they followed a Red Sea hills route. In either case their original northward spread needs to be dated well before the ninth millennium BCE.

The Boreafrasian sub-sub-branch has an apparently somewhat deeper stratigraphic time depth than Chado-Berber, probably on the order of about 2000 years more (the adjusted cognate retention chart [Figure 5] shows 2-3 per cent for Boreafrasan [Egyptian versus Semitic] compared to Chado-Berber at 5-7 per cent). The proto-Chado-Berber extension across northern Africa indicated in the

linguistic evidence has a strong parallel in the archaeological establishment of the Capsian cultures, at first pre-agricultural and grain-collecting, across those areas from 10,000 BP onward. That correlation, if sustained, would project the earlier split up of proto-Boreafrasan to around 12,000 BP, and indicate that we should look for the pre-proto-Semitic speakers in an archaeologically-attested settlement of people coming from northern Egypt into the Levant around that period. In light of this dating, the Mushabi culture seems a particularly plausible candidate for the culture of the pre-proto-Semitic speakers, providing the original proposals about its African provenance (Bar-Yosef 1987) hold up. (Proto-Semitic, of course, was a much later descendant version of the original pre-proto-Semitic language and was spoken at around the sixth or fifth millennium BC; Diakonoff 1998).

The Nilo-Saharan

The Nilo-Saharan family clearly originated in the Middle Nile Basin, east of the Ethiopian highlands. The distribution of the extant descendant languages of the three earliest branchings – Koman languages along the eastern side of the basin, Central Sudanic in the far southwest of the basin, and early Northern Sudanic (as argued here) in the southern eastern Sahara – places the proto-Nilo-Saharanans in the heart of the basin, probably (considering the aridity of climate in the Terminal Pleistocene) in areas south of the confluence of the White and Blue Niles (Ehret 2003b).

The hunting-gathering and fishing lexicon of early Nilo-Saharan remains to be adequately studied, so there is much still to learn in this case. It appears from the reconstructed lexicon that, by the period of time immediately preceding the proto-Northern Sudanic node of the Nilo-Saharan tree, some Nilo-Saharanans may already have begun to collect wild grains. This development may well have been a result of encounters by the forebears of the Northern Sudanians with Afrasan peoples east of the Nile, as they spread north into the Sahara following the advancing tropical rainfall belts after the end of the Younger Dryas. That is a matter worth future investigation. The lexical data hints that we may eventually discover that the first making of pottery in the Sahara and Sudan traces back to the period before 10,500 B.P. as well.

If we examine the linguistic stratigraphy of the Northern Sudanic division of Nilo-Saharan, we discover two main stages in the spread of food-producing ways of life. In the first era, extending from perhaps before 8500 down to the seventh millennium BC, cattle raising took hold, followed by the development a more sedentary living style, with round houses and granaries, and a probably more varied food production that included the cultivation of sorghum and eventually gourds. But the number of societies that evolved out of this beginning remained very few – as of the seventh millennium, just three, the pre-Kunama,

the proto-Saharans, and the proto-Sahelians, can be identified (see Nilo-Saharan tree of relationship) – and so for up to 2500 years the geographical spread of this new economy must have remained relatively restricted.

The second era, which began with the break-up of the proto-Sahelian society, would have been marked, in contrast, by a rapid radiation of new societies out over very large regions. Referring to the Nilo-Saharan family tree, one can see that a succession of divergences followed. The proto-Sahelian language gave rise to the ancestral For and proto-Trans-Sahel; proto-Trans-Sahel in turn diverged into Western and Eastern Sahelian divisions; and Western Sahel then broke up into Songay and Maban branches. At the same time Eastern Sahelian diverged into three branches, Astaboran, Rub, and Kir-Abbaian; and Astaboran and Kir-Abbaian then each further broke up into subgroups. All these divergences have been argued to have taken place between the late seventh and early fifth millennium BC (Ehret 1993). The distribution of the descendant languages of this series of rapid divergences ended up as far apart as the Songay (Western Sahelian) in the areas east of the Niger Bend and the Nara (Eastern Sudanic/Astaboran) at the edge of the Ethiopian highlands.

The history of the divergence and spread of Nilo-Saharan food producers thus has an excellent overall fit with the archaeology of the establishment and spread of the new economy. The first divergences within Northern Sudanic imply a long-term, relatively restricted occurrence of the earliest stages of food production in the eastern Sahara. The era of the wide spread of cattle raising across the southern half of the Sahara, around the sixth millennium, is just the period in which the linguistic evidence would situate the great radiating out of the speakers of the descendant languages of the Sahelian sub-sub-branch of Northern Sudanic across those same regions.

Histories of Contact

The second fundamental contribution of linguistic stratigraphy studies is what they can tell us about cross-cultural encounter. With this point we return to some issues raised at the very beginning of this article. The long presence of Nilo-Saharan and Afrasan language families, in adjacent territories across large expanses of northeastern Africa, certainly should be directly attested in multiple periods of word borrowing from one family to the other. In addition, there should be examples of later language expansions overlaying earlier spreads of languages belonging to the same family, apparent in intra-familial word borrowing. Both kinds of histories abound. The Nilo-Saharan materials relating to both inter-familial and intra-familial contacts in the southern and eastern Middle Nile Basin have received considerable attention (Ehret 1983, 2001, 2003a). Our studies of similar phenomena in the northern Middle Nile Basin and surrounding regions

are much less advanced. Nevertheless, we can give preliminary identification to several important periods of inter-familial contact involving Afrasan and Nilo-Saharan speakers, as well as to intra-familial contacts among Nilo-Saharan speech communities.

Intersocietal Interactions

The earliest contacts clearly identified so far in our studies were of the proto-Sahelians with probably two different Afrasan-speaking peoples. These encounters would date to roughly the seventh millennium BC, if the proposed archaeological correlations hold up (table 6). The first two root words (1 and 2) in the list that follows are of the kind that normally reflects considerable bilingualism and intimate cross-cultural interactions. The adoption of a new word for “three” is particularly arresting, because the adoption of numerals usually goes along with a significant amount of word borrowing in other areas of culture. So the presence of these two loanwords strongly suggests that we will eventually discover more such Afrasan loans in proto-Sahelian. The borrowing of the word for “three” in particular – because it was maintained in Chadic, but not in Cushitic, Egyptian, Berber, or Semitic – favors the conclusion that these contacts were with the linguistic forebears of the Chadic branch of Afrasan before they moved south out of the Sahara.

Table 6: Afrasan loanwords in proto-Sahelian (PSah)

(loanwords indicative of general cultural impact)

- | | | |
|---|----------------------|---|
| 1. | *har “rain; to flow” | Proto-Afrasan (PAA) *har- “flow” |
| 2. | *hinzah “three” | PAA *xaynz- “three” (Chadic; <i>not</i> in Cushitic) |
| (loanword reflecting culturally specific adoption of new item of culture) | | |
| 3. | *ay “goat” | Beja <i>ay</i> “goat” (< proto-Cushitic (PC) *?az- “sheep, goat”; *z > y /V_ is a specifically No. Cushitic change) |

The third root, meaning “goat,” represents an entirely different contact history, of spread by diffusion from the east, specifically from a very early language of the North Cushitic branch. This branch of Cushitic has a single representative still spoken today, Beja. The spread of this word most probably accompanied the spread of the animal from very early North Cushites to the proto-Sahelian livestock raisers.

Important early influences flowed the opposite direction as well. The Red Sea Hills may have been a region of recurrently shifting ethnic and linguistic boundaries during the middle Holocene. The very early North Cushites would most likely have inhabited the southern half of that zone in the period

immediately preceding the fifth millennium BC. But intriguingly, the extant North Cushites of the present day, the Beja, appear to have emerged out of a later re-expansion across the region. Beja contains a notable set of Nilo-Saharan loanwords of the kind that often reflect the spread of the borrowing language into the lands of the source language, with people gradually, over a number of generations, giving up their earlier language in favor of the borrowing language. The loanwords in this case, like the proposed Chadic set in proto-Sahelian, include everyday verbs and numerals. Again as for the proto-Sahelian borrowing set, we can expect that future study will reveal the presence of more such loanwords. The particular source of the loans in Beja was clearly a Sahelian language: the borrowed numeral for “five” pins this source language down to the Kir-Abbaian sub-branch of the Eastern branch of Sahelian. This evidence tells us that at some period in the last 5000 years BC, a Kir-Abbaian people inhabited large parts of the southern Red Sea hills region. Then North Cushitic-speaking people, the ancestors in language of the Beja, re-expanded and assimilated these particular Kir-Abbaians into their society.

Table 7: Sahelian (Kir-Abbaian?) loanwords in Beja

farr/fafar	“to jump/to jump, hop”	Proto-Saharo-Sahelian (PSS) *p ^h à:r “to jump (about)” (proto-Nilo-Saharan (PNS) *p ^h à:r “to run about, run away”); shows PSS semantic shift. Beja also has <i>bir</i> “to fly,” but this is a distinct root: it is the regular Beja reflex of PAA *-pur-/*-pir- “to fly”
foor	“to flee”	PNS *p ^h ōr “to flee”
gara	“fenced-in homestead”	PNS *gà:r “to encircle, enclose (in a fence)” (as in Gaam (Kir-Abbaian) <i>gar</i> “enclosure”)
as-	“five” (preserved today in Beja only as the base of numerals 6-9)	Proto-Kir-Abbaian (KA) *as “five,” from PSah *has “fingers” (loss of *h and meaning innovation, “five,” are specifically Kir-Abbaian changes)

Eastern Sahelian influences on the ancient Egyptians

Another notable early case of Nilo-Saharan loanwords spreading to Afrasan languages is in ancient Egyptian. The borrowed words so far identified in this instance tend to be terms for items of material culture. They can be taken, in other words, to reflect the spread of the items named by the words from Nilo-Saharan to ancient Egyptian culture. Where we do have diagnostic evidence, it appears that the source language of the loans in ancient Egyptian belonged specifically to the Eastern Sahelian group (case in point, *sar, “thorn fence of

cattle pen”). The loanwords include terms relating to crops of Sudanic origin, but also cattle-raising terms, suggesting that Egyptian ideas about cattle may be beholden as much or more to southern, Sudanic influences as to North African or Levantine influences. The phonology of at least two of the loanwords (original *r > ancient Egyptian 3) places the time of borrowing very early in Egyptian history, most probably in the pre-dynastic era.

Table 8: Eastern Sahelian loanwords in ancient Egyptian

<i>bdt</i>	“bed (of gourds, etc.); <i>bddw-k3</i> “watermelon” (Late Eg. <i>bdt</i> “cucumber, gourd”)	proto-Sahelian (PSah) *buḏ “edible gourd”
<i>s3</i>	cattle byre” (< *sr)	proto-Eastern Sahelian (PES) *sar “thorn fence of cattle pen”
<i>mrw</i>	“bulls”; <i>mry</i> “fighting bull”	PSah *ma:wr “ox”
<i>pg3</i>	“bowl” (< *pgr)	PSahSah *po:Kur “wooden vessel”
<i>ds</i>	“jar”	Proto-Sudanic *DɔS “waterpot (?)” (capital D and S represent consonants of alternative possible reconstructions)

Future studies in this vein will surely find more examples of material cultural influences in ancient Egypt coming from the south. When we undertake such studies, we must not neglect the possibility that we will uncover Nilo-Saharan loanwords in other semantic areas of ancient Egyptian vocabulary, reflective of other kinds of south-to-north influences.

The spread of later-introduced crops and animals

A variety of later diffusionary spreads of crops and animals took place across northeastern Africa. The full consideration of this topic is not possible here. But as a teaser, we might mention three interesting results the language evidence provides us already with respect to domesticates introduced from outside the continent:

1. wheat and barley spread south from Egypt to Ethiopia and Eritrea via the Red Sea hills, not from Arabia (this means the spread took place by the fourth or early third millennium, before the full drying of the Sahara) (Amatruda 1971; Ehret 1979);

2. wheat and barley, on the other hand, apparently did not advance from Egypt to the Nubian stretches of the Nile, but instead came there indirectly from

the east via Cushitic-speaking peoples, probably those of the northernmost Ethiopian Highlands (and so possibly only in the last 2500 years); and

3. camels, curiously, reached the Beja not directly from Semitic-speaking nomads, but from the sedentary Nile Nubian communities, showing that Beja camel raising did not develop probably any earlier than 2000 years ago. (Whether they were previously nomadic raisers of goats and sheep before they added camels to their repertoire is another matter).

Table 9: Eritrean/Ethiopian Cushitic loanwords in Nile Nubian

*illee	“wheat”	PAA *ʕeyl- “grain plant, cereal” (Beja <i>e/la</i> “dry grass, hay”)
*serin/m	“barley”	Beja <i>seram</i> “barley”; Agaw *sərn- “wheat”; regional Eastern Cushitic: Saho, Soomaali *sern- “wheat”; Egyptian <i>š.r.t, šry</i> “barley”

Table 10: Nubian loanword in Beja

kam	“camel”	Nile Nubian *kam, pl. *kamli; Nubian speakers analyzed original root *kml as consisting of sing. *kam- plus Nubian pl. in *l; Beja adopted the Nubian singular form as their word for the animal
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Deciphering Meroitic

A further topic ripe for renewed investigation from a linguistic historical perspective is the problem of the relationship of Meroitic, revisited in the light of what we have discovered here. The linguistic stratigraphy of Nilo-Saharan history shows the whole of the northern Middle Nile Basin to have been primarily the domain of Eastern-Sahelian-speaking peoples for most of the past 7000 years. The Eastern Sahelian group at the very beginning of this span diverged into three branches, two of which, Astaboran and Kir-Abbaian, have direct relevance to this problem. The Astaboran languages spread across southern edges of the Sahara region, probably in the fifth millennium BC, from as far west as the areas just east of Darfur, where the proto-Western Astaboran society is most probably to be placed (Thelwall 1982), to as far east as the edges of the Ethiopian highlands, where the Nara were located in later times (see Nilo-Saharan family tree for these relationships). The central parts of the Middle Nile Basin were occupied equally early, if not earlier, by the expanding Kir-Abbaian

group. That the Meroitic language was spoken in the middle of the regions long inhabited by these two primary groupings of Eastern Sahelian peoples means that the very first hypothesis we ought to test out is that Meroitic belonged to one or the other of these two Eastern Sahelian branches.

We can say more on this point. Meroitic was a language of great cultural and political importance. Languages of that kind of importance leave behind loanword evidence of their former existence in a region. Dongolawi Nubian, spoken in the old Napatan heartland, contains just such a substratum of word borrowings, not specifically attributable at this point to Meroitic, but most definitely from another, now extinct Eastern Sahelian language (table 11).

Here again our most parsimonious point of departure would be the hypothesis that these loanwords came from Meroitic. The publication of *A Comparative-Historical Reconstruction of Nilo-Saharan* (Ehret 2001) gives us the kind of very large etymological dictionary we need, with an abundance of language-specific data, for testing out this hypothesis.

Table 11: Loanwords in Dongolawi from an Extinct Eastern Sahelian language

<u>Loanword</u>	<u>Expected Shape in Dongolawi</u>	<u>Nilo-Saharan root</u>
na:r “river bank”	*ga:r (this regular reflex occurs in Nobiin)	*ŋgwa:d “side; river bank”
te:b “to stand, stand still, remain, stay”	*de:b	*tē:b “to rise up” ((PES semantic innovation, “rise up” > “stand (in place), stay”))
wa:s “to boil”	*wa:s	*wá:š “to bubble” (PSah semantic innovation, shift of meaning from “bubble” to “boil”)
hung “to kneel”	*uŋg	*hùŋg “to bend (intr.)” ((PSah semantic innovation, semantic shift from “bend” (in general) to “kneel, bend down”))
girgid “gums (of teeth)” (< pre-Dongolawi *girgirt-, redup. root plus *t n. suff.)	*nid (< *nirt) (the regular Nobiin reflex <i>nīit</i> means “tooth”)	*ŋjár “exposed flesh” ((PES semantic innovation, “exposed flesh” > “gums (of the teeth)”); *t n. suff. is also a specifically Eastern Sahelian addition to the root)

Summing up

The long-term histories of the Afrasan and Nilo-Saharan language families make two very important points about human history at the intersection of Africa with Eurasia. The points are crucial because they force re-examinations of long accepted Western and Middle Eastern views on history that simply cannot be sustained any longer:

1. Afrasan (Afroasiatic) is an African family every bit as much as Nilo-Saharan. Its origin region lay well south in Africa and nearly all of the history of the Afrasan-speaking societies played out in Africa. Only one offshoot of the family left the continent.

2. Both languages families began their earliest periods of expansion within northeastern Africa well before the development of food production. Those expansions were driven by other factors of subsistence, environment, and technology, and not by the possession of herding or cultivation.

For both families, their subsistence strategies, as attested in the reconstructed lexicon, have strong echoes in the archaeology of subsistence change between 15,000 and 6000 years ago across greater northeastern Africa. We do not have to look farther afield to find the archaeological correlates of their linguistic stratigraphies.

The early Afrasans, from the evidence of their reconstructed lexicon of subsistence, stand out in particular as having been utilizers of wild grasses (and eventually wild grains). In later periods, from the ninth to the sixth millennium BC, the different branches of the family appear separately to have turned to food production, and to different kinds of animal raising and different crops, depending on the different climatic zones they inhabited, and the different influences they had come under, by that time.

The Nilo-Saharans before the Northern Sudanic period in their history can be less certainly identified with any particular kind of gathering and hunting. But from the proto-Northern Sudanic stage onward, the history of subsistence lexicon shows these particular Nilo-Saharans to have been central participants in an African creation, first, of cattle raising and, then, of cultivation of Sudanic crops. Contemporaneously across much of the southern Sahara, however, other Nilo-Saharan speakers pursued a highly productive food-collecting system based on aquatic resources. We can identify the aquatic-based people as probable Nilo-Saharans because of their close cultural relationship, notably in ceramic styles, to the earliest cattle raisers, here identified with the proto-Northern Sudanic society. The proto-Northern Sudanic cattle keepers, as suggested earlier, could be considered a regional offshoot of the aquatic Nilo-Saharans, differing in subsistence practices because they moved into lands with little surface water and

poor access to aquatic food sources and so were forced to develop a new way to make effective use of those lands.

From at least the early middle Holocene, we are already able to identify some of the cases of inter-familial and intra-familial contacts among Nilo-Saharans and Afrasans. An Eastern Sahelian people, notably, influenced pre-dynastic Egyptian material culture. Other Eastern Sahelians became a major component in the demic ancestry of the North Cushitic (Afrasan) Beja peoples of the Red Sea hills region. Diffusion of material culture also sometimes passed the other direction, as we see in the case of the spread of goats (and presumably also sheep) from southwest Asia, via Afrasan peoples of the eastern Sahara, to Nilo-Saharans of the southern half of the Sahara region as early as the seventh millennium. The potential of this kind of study for attaching detail and complexity to the course of cultural and economic change and interaction among societies is immense, as a number of studies of African history farther south are already beginning to show (Vansina 1990, 2004; Ehret 1998; Schoenbrun 1998; Klieman 2003).

This article seeks to raise a strong challenge to archaeologists and historians and to physical anthropologists to resituate the geography of our thinking about the histories of the peoples of northeastern Africa. These peoples were fundamentally African; they were not intruders from outside the continent, contra long-held Western ideas about these regions. Along the way we have offered a provisional overall scheme of human change in greater northeastern Africa over the long term of the Holocene, and a first look at some of the more specific elements in the story from the perspective of the linguistic evidence. We have also pointed to further directions in which we can take this kind of work. A notable example would be the contribution that the data of reconstructed Nilo-Saharan may be able to make to the deciphering of Meroitic.

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