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The Nilo-Saharan Languages: A Comparative Essay

Lionel M. Bender

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aj adjective
av adverb
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*Af Proto-Afrasian

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C Maba(n) Family
Ch Chadic Family
*Ch Proto-Chadic
C.S. Central Sudanic
Cu Cushitic Family
*Cu Proto-Cushitic

D For(an) Family
Dong. Dongolese Nubian

E vowel in i ~ e ~ a range
E East Sudanic Family
Ek East Sudanic k-Group
En East Sudanic n-Group
E.S. East Sudanic

F For (under Foran)
F Central Sudanic Family
Fc Central Sudanic Central Group
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Frag. Fragment

G Gao (under Songay)
G Gule (under Koman)
G Berta

H Kunama Cluster

I vowel in i ~ e range
I Ik (under Kuliak)
I Ilit (under Kunama Cluster)

K Kuliak Family
*K Proto-Kuliak
Ko Komo (under Koman)
Kord. Kordofanian
Kr Krongo (under Kado)
Kw Kwama (under Koman)

L Kado family

Mb Maba (under maban)
Mm Mimi (under Maban)
Mn Mande
Ms Mesalit (under Maban)

n noun
N Nyangi (under Kuliak)
NC or N-C Niger-Congo Phylum
*NC or *N-C Proto-Niger-Congo
NS or N-S Nilo-Saharan Phylum
*NS or *N-S Proto-Nilo-Saharan

O vowel in a ~ o ~ u range
O Opo (under Koman)
Om Omotic
*Om Proto-Omotic

S Sai (under Gumuz)
S Soo (under Kuliak)
Se Sese (under Gumuz)
S-C Satellite-Core Family
S.S. Semantic Set
s.o someone
s.t. something

T Twampa (under Koman)
T Tulishi (under Kado)
T & B Tucker and Bryan (see References
Tb Tubu (under Saharan)
Td Teda (under Saharan)

U vowel in o ~ u range

v verb

X/Y occurrences in Outliers/ /S-C or S-C/Core

I Koman family
*I Proto-Koman

J Gumuz

K Kaado (under Songay)
K Kanuri (under Saharan)
K Kokit (under Gumuz)
K Kunama (under Kunama Cluster)
K Kadalla (under Kado)

Z Zagawa (under Saharan)
Z Zerma (under Songay)

+ morpheme break
- possible morpheme break

* "Good Isogloss"
** "Excellent Isogloss"
I *Core Level
II *Satellite-Core Level
III *Nilo-Saharan Level
IIa Atlantic Family of Niger-Congo
IIb Volta-Congo Level of Niger-Congo
IIc Ijoid family of Niger-Congo

4. Nilo-Saharan Fragments

List F contains *N-S Fragments* identified in the reconstruction work. Fragments are those forms found in the data in at least two families whose representations and/or distributions are inadequate for status as a probable isogloss. For example, an item found in Families B, K, C, D, L does not fulfill the criteria for a level-I isogloss (here, only L is representated), nor level-II (here, C, D, and L are not sufficient), nor level-III (B and K with a fragment of Satellite-Core is not sufficient). Many fragments are, of course, isoglosses in East Sudanic, Central Sudanic, or Nilotic.

Alphabetical order of items is the same (*a, b, ɓ,* etc.) as in the Nilo-Saharan Reconstruction Lists. However, families are also listed *in alphabetical order* rather than according to Levels III, II, and I, thus: A, B, C, D, E (Ek and En where these occur), F (Fp and Fc where these occur), G, H, I, J, K, L. Each entry has items from two or more families. Items of identical shapes follow alphabetical order, e.g. an item occurring in Families B and I precedes one occurring in B and K (see *aman* on p. 143).

The presence of various prefixes interferes with the alphabetical order in some cases. Many times known or fairly certain prefixes are "peeled off" to allow the root to be seen, but there are many doubtful cases. For example, see "hole, cave, dig on p. 143, which has *a-* or *ɪ-* in C, but *ku-* or *kɔr-* in Fp.

The citations given are a sample and are usually not exhaustive of the variation occurring, although an attempt has been made to be fully representative. Likewise, the glosses are left incomplete in some cases to save space.

In the final incorporation of the new Kadu material from Schadeberg 1995, several Fragments approached the status of Satellite-Core or Core isoglosses, but only four were found to be strong enough to be retained and incorporated into Lists A.4 and A.5.

F: NILO-SAHARAN FRAGMENTS

Sample Citations	Semantic Set, Gloss
a	
I: aarus; L: orri, ʊrri, ʊʊrʊʊri	38, thin (Core iso. ??)
C: ab-; D: ba- ~ -ab-, -ʌb-	6, drink
C: ac, as; G: að; K: ac, ats	14, come, enter, etc.
C: adaw, ndəw, nduo; E: ɖawi, ʈaal, t/ɗaaw(a)	25, transfer
B: adi; D: de(i); E: (u)di, ote; F: iTi	24, ant, bee, etc.
E4: afad; H: kokoba; I: kapa	8, blood, red
B: afi; K: ɔf	36, cough, spit
C: agu, ɪgu; Fp: kugu, kɔrŋʊɛ; Fc: gU	40, hole, cave, dig
En: ag(u)wa, koo?, kau; J: (o)ka, wɔɔka	28, moon, sun
C: aikizi; J: gi'ziina	13, sad, poor
F: aji, ija; K: aj	49, open, shut, marry
H: ake; L: (ak)ki, ikki	36, say
D: ala; L: allɔ, halla	45, pot, gourd
C: ale; D: all- ~ la-; J: alo(o), aro	36, laugh, song
A: alula; C: iluk, lyun; F: LɯN	28, after, before, etc.
B: aman; I: mono	35, friend
B: aman; K: may	13, sick
C: amɓokol-a; I: ɓ(w)ɔŋk(')ɔ, ɓank'o	50, frog
D: -ana, -a(u); Fp: ana ~ una; Fc: n(d)aa	40, make, help
C: aŋgab, aŋgak; H: 'aŋkwa	45, gourd, boat
E2: ari, iiri; J: eerɛ	11, hand
C: ar(oŋg); D: (k)arr-, arrɔ	15, split, divide, plow
D: arra; E: ur(i), waar; F: iri	7, black, evening, etc.
B: aruma; F: aroa-; G: -arum	50, crocodile, etc.
B: arururr; L: (indi-)guruuru	12, hail
C: 'asaal; H: sal'le, salle	34, four
D: assa, E: wəs, iis, etc.	17, dog
C: assek, asik; K: cek-	6, food, dura
I: at^{h}e; J: 'ŋt^{h}a	22, bamboo
C: auwəl; ɔlu-k; I: wʊl, uul-	21, tail, penis
G: ayu, iyu; H: kaya	4, belly
J: azəx^{w}-; K: ec-, (i)yes, yec, iɬye; L: as(s)u, (y)ʊssu	27, know (Core iso. ??; cf. *was)*
ə, ʌ	
B: ərgarr; G: miš-erge	5, partridge, etc.
B: ʌsɔi; C: ʌsʌk, ʌse	39, forest, woods
b	
B: baine, baɲe; D: bain	32, old
A: baj; G: baaca	6, beer
E: baŋ, abaŋ; Fp: bɔŋgɔ, vɔŋg(w)ɔ	47, cotton, clothes
C: baŋgadɛdɛ; I: -pɔk, ap^{h}o; J: -booŋu, bɔŋwa	28, after, back, behind

Sample Citations	Semantic Set, Gloss
C: barti, abir; F: barua, ɓari, gbara	12, cloud, rainy season
B: bas; C: abus	33, smell
B: bas; K: bos, bes	19, ear, hear
A: bat-, batu; I: bat-	37, wait, sleep
D: bau, abu; F: Bu, ɓ(w)o; I: ab, bwi	25, carry, send, etc.
C: bayina; H: ba'ya	13, bad, sick
B: bədi; H: bə'da	31, neck, back
G: bədi(ʔ), bodi(ʕ); I: ɓath, Bat, ɓəs', ɓas(')	23, warm, hot
J: bəəŋʔ; L: obuɲi, ɔbu	37, stand, wake up
G: bə(ə)š-u; H: -baca-, -bad; J: bats'	15, break, fight
B: bələmma, bar(r), bɔli; J: bal	28, star, bright
H: -bə'le; K: ibileron, ber-on	27, forget, lose
C: bəŋ; F: (ŋg)ban(e); I: baŋ	32, always, now
C: bəy; J: bee	14, fall
B: bebur; H: ulbur-	15, knife, stab
A: beeb(e), bemɓaw; K: bub, ibubisa	19, hear, deaf
D: bel-; L: abɪrɪ	36, say
B: belli, billi; D: bel	12, lake, well
Ek: beL; En: bar; K: ɓelgɛn	12, god, lightning
A: -bena, -beena; Ek: baŋŋid, bena	30, lip, language
C: bey, ɓey; G: beɛguu ~ beego; L: waay ?	5, bird
B: beʔ(a), bɪɛ, bei; J: ɓi-, bii-	46, house, roof
En: bebel, mpɪpɪl; I: abeeb	48, sour, bitter
B: bere, bɽi; C: abɪr	20, face
F: bi, kobi; I: ib, pip, beb, piʔi	41, cow, buffalo
C: bia, (a)bi, ibi; L: -biiyu	37, sleep
A: bi(bi); Fp: -bi; Fc: tibi	7, black, green
B: bilia; K: billi	28, before, morning
A: biŋ; H: abi'na	50, elephant,warthog
C: biŋga, piŋ, fiŋ(g); E: bɪn-	1, full
A: bita; I: binte	6, porridge, etc.
D: bitaaŋ; L: bitiŋɔ	32, always, now
I: bizien, bizɪɛn, biiza; J: bi(i)ža	28, star
En: bɪlgɪŋ, ɓiliŋ; L: mbiligi	46, door(way)
A: bo, bua; B: bo	46, granary, house
B: bode; D: bɛdɛ; G: p'ɛɗɗo	32, old
A: bom, boŋ; C: bo	11, head (cf. Iso. #5)
A: boro; B pl.: baru; I: burun	35, person
A: boos, bo(o)su, bosu; B: bašo, bušo	2, ashes, earth
B: borro, boru; K: ɓor	28, dry season
B: boscɛk, buscek; J: bɔc'ɛš	37, stay, live (dwell)
B: bosku-; G: bɔš	36, curse
D: bɔd-; K: bɔɗ-	3, bark
C: bɔŋ, (m)boin; H: boɓo'na, bubun-a	33, nose
B: bu-, bo; H: 'buʷa	6, eat, food
A: bugu, bukk(a); B: boŋgo	46, house, shed

Sample Citations	Semantic Set, Gloss
Ɓ: bultu; D: borɲo; E: buraŋ; G: boorid	17, fox, feline
Ɓ: bura; I: baara, bəra, bark(e)	43, want
C: buraga; J: borgʸa	22, flower
G: burdale; L: boturu	50, warthog, pig
Ɓ: burtu, bur(r)su; G: bur	6, beer, thirsty
H: buta, buu'ta; G: budu, bɔdɔ	41, bull
D: but(t)e; I: pwɔta	38, thin, short
G: buθo(ʔ); J: bʊt	14, descend
ɓ	
H: -ɓabʌ; J: bafa	33, lung
F: ɓi-; J: be(e)	21, hair
K: ɓodok, mɔk; D: bɔk	34, ten
F: ɓoR; Ek: fur; En: por	3, bark, basket, sack
Fp: ɓutɛ; Fc: muta; G: muuθe, moudi?	34, three
c	
I: cari, acul; K: cil, tsɔra	50, baboon
B: cejin; K: cɛ	16, kill (cf. #197)
A: cill; B: celli	3, basket, sack
A: ciraw, kyiraw; B: cafori, cɔuri; H: šurka	5, bird (cf. #343)
B: cur-, sur-; C: asur; D: suur, culuk; G: s'us'ul	47, name, body, shadow
d	
Fp: da, ɗa; J: da-	1, very, many
H: daa'ta; I: dɛyda, dida; J: da, də	2, thing
B: dabo; H: ada'ba	12, rainy season
A: dabu, daabu, doɓu; I: -dabə	49, open, shut, tie
A: dago(n)-; I: diga?	26, good, happy
A: dai, day, dey; B: daidai	12, well (n.)
H: dama; C: -daŋna	46, house
A: daŋ-; L: adaŋ	25, gather, give
A: -daŋ; C: andoŋg-	47, dress
A: daŋgal; H: dag'ga	46, door(way)
B: dar; C: darap; L: ɛɗɔɔlaana, aɗalaana	49, tie, sew
A: daši, dees(i); B: tasa	15, axe
B: dau; D: do(w); F: *drU; L: +du	11, head
I: daw, dau, addawa; K: doeak	50, baboon
Ek: defene; En: teffa; H: fefena	19, leaf (cf. dɪfɪn, 'hair')
B: dei, dai, dao; K: dɛ(a)	11, foot, leg
C: dek, tɛk; I: dɛk	49, open, tie
A: deki; D: tik-	49, put, pull
C: -dɛɛkal, (n)dak(k)alak; D: dokella, dokɛlla	38, small, short (cf. ɗugo)
C: dɛre; J: dararia	5, pigeon, dove

Sample Citations	Semantic Set, Gloss
C: dɛrɛ, dari; E: terig, derug	19, deaf, dumb, leaf
B: diddi; K: udud, doɗa, dod	31, neck, shoulder, etc.
D: d-ido; G: dididaŋ; J: dɪdɪgša	2, stone
C: diile, ndir; Ek: ṯɪrr, ṯuru; En: tiiri	31, vagina, buttocks
F: -dili, -dir; L: aɗiila, aɗula	26, good, right
B: dir-, tIl-, tir-; C: -dil-, ter-; E: der; F: -ḏi(i)ri, -ṯilli	38, small, thin, sharp (S-C, Core isos.??; cf. #25)
B: dira?; C: nder; F: dVr; L: -daru	32, slow, fast, etc.
A: dirgasandi; H: targa-, tirg-	37, wake up
B: -d(i)ri(ŋ); K: der, ɗɛr(r)	50, rat, mouse
B: dɪfɪn; C: tifi-k, teefa, tiifa	21, hair (cf. defene, 'leaf')
B: doga, dagar; D: dogala	35, baby, child
I: dok'ɔm; J: -dɛkʸa	42, right (hand)
F: d(r)a, ata; L: adiiri, aduulu	48, bitter, sour
C: dum-; G: do'ma	27, watch, guard
C: dum, tum; H: tumma	1, all
A: dung-; H: daŋo-	23, warm, hot
A: dur; B: durubi; C: ɪdor; I: dorr	15, hit
D: durɛ; L: (n)ḏuli(k), tʊlɪ	22, flower
C: durmi; D: d-ormi, d-ɔrmi, gorna, gurna	33, nose
E: duru, duluN; H: turuda	1, big, fat
B: dut(u); D: duTe; E: diide; K: dud	45, gourd, pot
B: duwa; C: (k)udum; H: tuwa	16, kill, die, dead
D: dwaŋ; K: da(a)ŋ	24, ant, termite
I: d(y)aaša, gyaša, J: c'yeša	11, thigh
ɗ, ḍ	
G: ɗɔk'ɔθa; H: tokka-da	36, ask
G: ɗugo, ɗogo; L: aduŋo, +ṭugu	38, short (cf. dɛɛkal)
K: ɗus; D: duš	15, break
F: ḍu(ɛ); L: uuḏu, t-ooto	44, excrement
e	
Ek: eb, ɛb; En: iib-(t)e; G: abəro; H: e'ba	21, tail, penis
C: efar, (yi)ifir; D: fira	50, giraffe, gazelle
D: -ell-; F: (E)re	49, push, etc.
C: -(e)mba; F: mba; K: ɛbam	35, boy, friend
C: esik; K: ɛskɛk	46, fence
D: -ewer-; I: awariŋ, a-weyo?	50, porcupine
ɛ	
B: ɛdɛ; I: twei, tsi, ti(a); J: dɪɪ	45, gourd, pot, bowl
E4: ɛl(g); J: (y)ila, iilə	4, belly
Fp: ɛnɪ, kyini; Fc: -ana; En: wʌn, waan	3, bark, hide
C: ɛr-; D: -il; G: ille	19, ear, hear

Sample Citations	Semantic Set, Gloss
f	
B: fadai; C: faila	2, mountain, stone
A: fafa, fəfa, fəfe, fofe; I: bwambi	10, breast, armpit
C: fakkak; Ek: fokki; En: afuk	11, ankle, thigh
A: far; B: fərkuso, fal-	40, work, change
B: fas-; G: fəše	15, break
B: faše; H: 'fase	26, happy, pretty
B: -fətu-; C: faato	2, village
B: fero; C: fara, fel; G: p'iir	35, baby, girl, woman
B: fi-; F: Pi, pia; I: p(')ɪ?	14, fall, throw
C: fida-k; H: fi'tiga	39, bow
D: fie; I: fu?	50, hare
A: fiila; D: fiiyɛ	36, tell, lie
B: fire, fɪr; D: furu; E: fil-, fɛr-; G: fiili, wiili	21, root, tail, worm
A: -firfir; B: forefore	5, bat
B: firki, fərgi; C: firgi	2, ashes, earth, marsh
A: forgo; B: forge	13, sad, sick
C: fou; I: fu	21, root
A: futa; J: puta	13, bad, wrong
g	
D: gaaro; Ek: Karɛ, kɔrul; En: (k)ulugit, gəwldɔ	50, fish
C: gaata; I: gəti	31, shoulder
Ek: gabad, kɔbda; En: kaɓunduce; F: gbanda	3, bark, net
H: ga'ge; J: gwaaŋ-guja	34, twin
C: gai, kai-; D: kwe; G: gɔɔ, gwi	35, child, baby
B: gan-; K: kan	30, lick
A: gand-; B: ŋganji	10, breast
A: -ganda; B: gandi	30, lip
B: gaŋau; I: gwɔŋgi, gwaŋgi	3, hide, bark
B: ga-(s)-, g/kas(-ar); H: gas	14, go, follow
A: gasu, gaas(i); D: ka(s)sa	45, gourd, bowl
I: gɔc^{h}; J: gɛk, gɛkʼ	49, push
B: gegeno, gingel; C: ɲɛgedamu, ɲɛgɛgɛmi	20, chin
C: genen; I: gənna	29, because
B: gene-te, gən, gin; I: gɛɛŋɛ	42, round, crooked
A: (g)gu, iggu; B: (w)ugu, uwu	34, five
B: gi; H: 'gee-	15, cut, etc.
I: gik'iš, gigiši; J: zakiisa	20, chin
B: gio, giu; K: gii?	6, beer, thirsty
B: girrbo, zirrbe; C: girwa	50, elephant,warthog
B: girri, hɪllɪ; C: kirm; L: +(ŋ)gir	31, neck, buttocks
B: go, gɔ; C: goo, gwiyɛ, guyɛ	25, take, steal
F: -go; I: gə-	32, old person

Sample Citations	Semantic Set, Gloss
C: goititiŋ, D: giti	13, ugly
B: gollu; C: koli	18, dry
H: 'gonta; I: goono, kono	45, boat, bowl, pot
Ek: go(o); usug(u); Fp: ŋga-, ŋgɔ, ugu	23, smoke, fire
H: goo'ba; J: kakoɓa	50, turtle
K: gug(u); I: gwɔg	25, buy, sell, hold
A: gui; B: gu(a), goi, gərsə, gogo	15, fight, etc.
B: (-gu-)ji; C: ka(n)ji; F: kaj-, (ka-)ju	9, bone, horn
A: gum; B: kəm-	49, shut
A: guna, guLa; K: gon-	27, see
A: -gur(i); B: ŋgəBəl, gullu, akora	5, egg
A: guri; guur; C: guuli; D: -ugul; G: gora	49, tie, sew
A: gurma; J: kurma	12, riverbank, lake
A: gyina; J: g(y)Enda, gindi	34, other, stranger
h	
A: haaŋ; G: aŋ	28, time
A: hancin, kancin; B: kaɲi, kanem, hanne	41, goat, sheep
A: hand-; B: kənna, kənara	41, calf
A: haŋ(g)a, koŋgu; I: haga	19, ear, leaf
A: haw(u), hao; D: u(u), yu	41, cow
C: hen; G: hiin	29, yes
A: hottu, hotta, horto, hotu; B: kuttu	48, bitter, sour
A: həndu; B: ontu	2, mountain, stone
A: huriew, (san-)huriaw; G: haiyiri	15, knife
i	
B: iare, iɛre; D: er(r)a, warat	48, salt
B: idi; K: edis; L: +aadi, +adi	39, tree, (fire)wood
En: iid, wiid; K: ede, eu, ida	10, breast, chest
C: ikir, ijir, irkɛr; D: giraw	43, like, love, want
C: iliin; H: lee	6, ignite, etc.
C: -ir; K: (?)ir, er, rija	40, work, cultivate, build, do
C: irimʌn, irinn; D: ir, ri, ɪrri; F: ri	25, catch, take
C: irniŋ; K: rinɛs	13, dirty
D: -iro; -orda; E: war(r)-; G: hoholo	5, egg
I: is, Is; J: iš(a)	5, egg
C: itek, ət; H: (u)uta	44, vomit
Fp: itɔgɔ; Fc: dɔgə; L: ittoŋ	50, hare
j	
B: jak; C: -dak	49, shut, close
C: jaŋga; En: ajjaŋ, ca(a)ŋ	1, very
C: jaro; D: jaara	17, cat, leopard

Sample Citations	Semantic Set, Gloss
B: jɛnɛ, gein, gined-; C: jin/m-ira-	13, dirty, rotten, ugly
Ek: jEr; K: 'jera	31, back (of body)
I: -jibai; J: 'jamba	12, rain
B: jilwa; L: -gilli, kili	50, rat, mouse
C: jiilitii; J: žijiləcə	27, intelligent
C: juŋ; D: -ɔyɪŋi	43, like, love
k	
Fp: -ka; Fc: -ak; I: k'a	6, eat
B: kaan, kana; Ek: Kaan; En: kɛ(ɛ)n	39, forest, tree
I: kaas, gajeb, gəyɪb; J: kaca, kɛca	24, bee, honey
A: kaba; C: kobu, kubu; I: (a)gaP; L: kaɓuga	12, bank, lake, well
B: kada, kad(d)a; C: kodo-k, kodda	26, good, well, sweet
H: ka'fa; L: koofo	44, excrement, dung
I: -kaga(?); J: gawkog^{w}a, maakog^{w}a	23, warm, hot
A: kai, kəy, key, gaay; B: hai	37, stay, live, stand
B: kaigə; I: ko?-, kwɔg, kogw-, kukwakwa	43, fear
B: kais, kəis, I: k'oz-	40, do, make
A: kak; I: kak	46, fence, roof
C: kak; I: kwak	15, split, divide
K: kaka; I: ikɔk	28, yesterday
C: kal; D: kola	20, eye, tear of
G: kal-, hal-; H: kal-a	30, tongue
A: kamb-; C: gam-, gem	11, hand, elbow
A: -kandu; B: kindu	20, face, cheek
B: kantana; H: an'tɛna, attɛna, atan-a	24, fly, mosquito
B: kapi; D: kobi; L: kuufi	39, arrow, spear, stick
C: kar(a); I: kar, kɛr, kɛɛle, kal-	25, transfer
B: karaan, kərənn-; D: kəl-, kɛl-; G: haala; I: -kara(n)	19, hear; 27, know
B: karedi; H: kare'da	7, black, night
B: karwa; C: kurunda	33, wind, storm
A: kas-, kosu; B: kas	49, pull
B: kəma; J: gəma	12, riverbank, lake
B: keb, geb; I: ka/əbakəp, kapikəp	25, bring
D: ke(e)r, kɛr; H: kee'la	34, other, stranger
B: kele(m), kere; D: gera, keera	3, basket
D: keli-; H: 'kailo	43, fear
B: ker; C: akar, ag/kʌr, kar(a)	14, come
I: kes', kis'-; K: k'edz-	6, bite, burn
Fp: kɛn-; Fc: kaŋa, ɲɛɛ; I: kina, keinə	2, down, earth, sand
B: kɛr; D: karra; E: k(w)ar; F: *klr	1, all, many, etc.
B: kifi, kihi; I: kep	39, shield
B: ki(i)r(i); L: -kirya-	46, bed
C: kikimi-; F: (k)uk(u); H: (k)uk(us)	2, ashes, charcoal
H: -kiša; J: -kɛš-	38, thin, small
D: kɪa, I: ki	24, louse, mosquito

Sample Citations	Semantic Set, Gloss
D: kɪt; I: kaṯi(i)li, kɛṯi(i)li	28, yesterday
A: ko; B: kuwa	22, baobab
A: kobsi; B: kobe(i)	11, hand, foot
B: kogu, koki; C: kokor; E: kog-, F: guku	5, fowl, pigeon
A: kokosi; B: kaskaši, kuši; K: kus-	3, bark, skin
B: kokko; K: kɔk	49, shut
A: kokob, kokop; I: ko-ko	49, put, shake
H: 'koli; I: ma-kula	40, begin, start
B: kololo; C: cɛlelo, iro; F: le, -lo	32, fast, slow (cf. #321)
Ek: kondon; En: ka(a)nt/ŋ; I: kwɔndɔl	42, crooked, left
C: koɲi; H: uku'ne, ukun-a	19, ear, leaf
A: ko(o)g-(u); B: ko(ʔ)a(i)	18, dry
A: koos-; C: kozam	19, ear, leaf
C: kosoŋga, kosaŋ; D: kɔsut	7, night
B: koše; E: kose, kosi, gusi	45, gourd, bowl
K: kɔb, koc; I: -kap	41, calf
B: kudu; C: ndoko; E: kwott-; F: kuɗ-	5, partridge, pigeon
Fc: kuɗ; K: gud	4, navel
C: kukurum; I: yakuru	22, beans
C: kulɛ; Fp: huru; Fc: kuri	46, fence
C: kuɲi/o, kiɲʌŋ, kuɲum, gonas; Fc: kVnj-	50, fish
B: kur-, kʌowar, kower-; En: kullo	50, rat, mouse
C: kusii; K: kus	47, clothes
D: kut; K: kudo?	17, dog
E: kuTur; I: kuturu, kuṯar, gutar	50, warthog
A: kuura, -ŋkura; B: karawu, korowu	50, turtle
D: kuuru; Fc: kulu	20, blind
B: kuwa; I: kuwas	29, perhaps, then
B: kwa-; D: pl. ku(w)a; H: ka; L: ka, kaau, kɔ(yɔ)	35, person, man
B: kwi; I: kwi-ji	20, face
E: (kʷ)ɪlɪd, culu; Fp: kIl-; Fc: (k)ɛl-	2, charcoal
B: kwosu, kuso; K: kwacik, kwats, wac	44, urine
k'	
I: k'ɔs-; J: k'ɔš, k'wɔšɛ	49, sew
G: k'uɗuk'u; K: dukuɗ^{a}; L: (a)ɗuguu(lu)	42, round
l	
B: la; C: laa	40, hole, dig
A: lab(u), lebu; H: lafuta; L: naɓu	2, earth, ground
A: -lagar; B: lagə	18, weak
B: lam-; I: lam(-)	26, wash
B: lambo; K: rɔ(ɔ)m	19, leaf
B: lɛlɛ; ila?; J: -lee-; K: -laɓ, lelɓ	18, smooth, soft, weak
C: lel-ti; F: lolu, olo; K: laluga; L: illur, iiru	1, far, wide

Sample Citations	Semantic Set, Gloss
D: liiya, le(l); I: yilan; K: ɬiŋat; L: aliili	28, after, morning, etc.
C: liɲ; F: lem, rem; L: alɪna	36, talk, insult
C: lirra, lera, lulu; H: ali'la	18, heavy, strong
C: loboka; H: luluma; L: -lubu, +lɔɓa	18, smooth, soft
B: lolo-, lalla; I: ɔl-; K: ilɔlɔŋ	49, put, touch
B: lon; C: lɔin	49, pour, spread
B: loo; C: la(a); F: ulu; Fc: l(ɛ)i; G: yeri	10, milk, suckle
B: loo; D: lo; F: loo, lu, lA	2, earth, place, thing
H: loola; I: lwələn	50, hare
A: loti; B: lot	49, spread, pour
En: lɔŋɔn; Fp: laŋ(g)a, Fc: Laŋ(g)a	39, stick, shield, spear
C: luho, -lida; E: lawa, luum; F: luwɛ	7, grass, green (cf. #146)
C: lu(liok), wulo(o); D: lool, lul; F: lu-	7, black, dark, night (cf. #146)
I: -luk-gas; J: lakoza, 'laakɔza	39, stick
C: lul(ak); F: lii, lulu, riyi; I: ulula	13, sick, pain, etc.
B: lus, losku-; I: lus-	40, dig, hide
A: lut(aw), lutug, lutuw; D: ulul	19, deaf, dumb
m	
J: maaŋwa; K: maaka, mayka	28, day
En: ma(a)(+t); J: mandʸa, maan/ɲja	23, fire
B: ma(a)ɾ(a), 'mʌraai; J: mireema	8, red
J: maat'ea; K: mad-	45, gourd
C: madɛ; H: el'mata (Ar.?)	3, scar
C: -maɗa; L: -modo	30, lip
G: maɗne, amaɗne; I: mata	14, follow, hunt
B: mangu; D: maaŋ, -imeŋ-	33, nose, smell (cf. #315)
E: ma+ŋ; Fc: man ~ min	12, water
C: maŋ(-ndi), maŋyi, maniŋ; J: maaŋaniila	26, happy, good
B: mardam; D: marga; Ek: marɛ; En: mo/urin; F: maru, muru	6, dura
B: margE, mʌrgɪ, murgE; C: marga-k	30, teeth
B: mədəŋ; G: madaŋ, mədɛgɛ, mɪdɪgi	50, giraffe, elephant, warthog
G: mduma; L: (i)iḏu(m)mu	34, five, ten
C: medding; L: -maḏagɛk, miḏigi, etc.	28, moon, star
B: mei(ta), meto; H: minda; I: me/ɛɗ, (m)bi(i)ɾ(te)	11, hand, arm, foot
B: meliu, moli; En: mUr, F: meri; G: more	24, ant, termite
E: mer; G: meera	6, drink, thirsty
C: meɾ(te); I: -mota	1, enough
C: mɛn-, miɲ-; E: mwiɲji; G: mənjo?	28, sun, star
G: mic'e/ɛ(?); I: a'dadamit; J: mɛta	5, bird
A: miri; Ek: mir; En: mɪr, mbir-	14, dive, throw
A: mi(si)-; B: me, mi; H: -mišida L: (ki-)me, -mɛ	12, rain, water
B: miše, miši(-de); I: meš, miš	27, know, stupid, dream
B: mi(yik); C: misik, miyik; G: pl. mihi	35, woman, wife

Sample Citations	Semantic Set, Gloss
I: mona-, maŋ-; K: muɲan	8, yellow
Ek: mo(o)r-, mur; En: mɔ(ɔ)r-, mur; I: mɔr	49, tie
A: mor; K: mOrut, mɔrɔk, morok	31, neck, throat
G: mosolo, mozolo; L: +masala; +msal	12, sky, rainbow
B: mu-; En: mɔɔ	49, pull, squeeze, shake
A: muraad; C: marat	2, thing
Fp: muri; Fc: mur-; G: amuɗu	21, worm, root, snake
C: muš-aŋ, mac, muooŋ; G: muše/aŋ, mušahar	35, woman, girl, baby
I: muuko; L: , +mak, adi-maaku	1, all, enough
B: murdʊɪ, mere; L: -mooroŋ	31, buttocks
mb	
B: mba; F: mba	15, swim, cut, hit
B: mbəš, -bus; H: ambo(s)-, am'boka	13, rotten
n	
B: namusu, namusə; C: musu(k)	44, urine
J: naŋ-es; K: ŋaɲ(u)	49, open, shut
C: nasi-se; H: 'nes-a	26, good
C: naus, naw(s); H: nau-, nawda; L: na(a), nna	25, transfer
C: ne, nə; Fp: ne; Fc: (-)ni, -ne	25, transfer
A: nin-a; C: ninjim	18, dry, hard
C: niniŋ-; Ek: (k)iɲiN	38, thin, sharp
B: nɪ; E: ni	16, die, kill
C: nol(l)i; I: naala	1, many
A: nuna, nune, nuun; B: wueni, win(i), wun(i)	23, fire
B: nusi, nušiš, (to)nos, nOs; J: aŋoos	16, die, finish
D: n-u(u)m; I: oŋo, ʊʊnNu; L: (i)nni, pl.: nooni	21, snake, tail (Core iso. ?)
nd	
A: ndeŋ, ndiaŋ; B: cigə, nde(g)i, ntægi	24, fly, mosquito
J: -ndoa; K: od	46, road
ɲ, ɲj	
En: ɲar; G: ɲeera, ŋeera	7, grass, green
C: -ɲere; L: -aaɲerri	26, pretty
C: ɲerem, ɲamble; E: nergi, neegi	7, black, night, evening
C: ɲæma; K: kiɲom-, kiɲɔm-	40, seed
A: ɲɪl; C: ɲelik	38, small
B: ɲjaŋg, njok; C: jɔkɔ, jɛkwɛ	38, few
B: ɲj-or(d)o, car; C: nojir(r), tejirri	18, dry, hard
C: ɲɲi, eɲi, aɲi, uɲyi; E: ɲi, ɲɔ	44, excrement
ŋ, ŋg, ŋgb, ŋk	
E: ŋaR, NaL-; H: ŋe(e)l-a	30, tongue
En: ŋatu(i)g; K: ŋatuɲ	17, lion

Sample Citations	Semantic Set, Gloss
B: ŋei; C: ŋgwei	50, monkey
G: ŋɛlu; H: ŋee'ro-, iŋera, aŋera	36, lie, word
En: ŋua; Fp: -ŋgU	33, smell
B: ŋuoli, ŋola; C: ŋgaiyo	20, cheek
B: ŋgavo; C: ŋgaba; F: gbagba	31, back, neck, shoulder
B: ŋgur; G: gure	21, penis
F: ŋg(b)a; L: ɲuŋwa, iŋwa	34, one, other
A: ŋkoro-; D: gɔrɔŋ	50, frog
o	
D: -o, -u; H: awa; J: wai, we(?); K: au	14, come, go, etc.
C: oaak; I: -wɔk	40, build, do, cook
E: ode, ood, wide; Fp: -dyo; Fc: (n)dɔ	7, night
B: ofori; D: furo	21, feather, beard
C: oko, yako; F: -kO	27, see, watch
C: ollu; I: ɛlɛ	50, monkey
D: ombol; G: abultu	4, navel (cf. Latin)
D: -orol; H: ora	42, round
B: owe, wo, ʊ(u); Fp: oʔɔ; Fc: o(o)	6, eat, bite
ɔ	
C: ɔŋg, uɲuŋg; D: -ɔ/oŋ, -uŋu; K: ɛɛŋ-, eaŋ	37, sit, stay, stand
D: ɔŋo; L: b-oroŋo	21, rope, beard
C: ɔɔs; J: ɔc	15, hit
p, p^{h}, p'	
C: papi; Fp: fafa ~ papa; Fc: fafa	12, riverbank 2, marsh
C: pore; G: bɔɔlɔ(?); L: baraŋ	31, neck, back
C: pul; D: fula	20, face, cheek
I: puma(a), bwa, aɓuun ~ aɓoo-; K: pun-	4, belly
I: p$^{(h)}$ut(i), p$^{(h)}$ʊt(i); J: pəts, p^{h}ets	14, exit
G: -p'iluwa; I: -p'ɪ	15, war(rior)
I: p'is, p'ist'iya; K: ɓis, bis-	39, spear, bow, arrow
r	
B: rac-; K: reac	49, pull, squeeze
B: raga; C: raja	46, mat, carpet
B: reika; L: luka, rukka	3, basket
C: -riji; K: rɛʔ, (r)rija	39, forest, woods
En: rima; yerm; F: s(r)ama, rama ~ masa	8, blood
Fp: riri; Fc: IrI, yer; K: ur	13, dirty, rotten
B: ru; F: -ru, -ro	43, fear, hate

Sample Citations	Semantic Set, Gloss
s	
A: safar(i); B: safarog	39, medicine, poison
B: sai; I: s'ɛʔ	48, bitter, sour
C: sakan(a); H: sekena	45, gourd, pot (loan?)
D: salla; I: -zal, zizɛl	37, live (dwell), sit
B: sam; C: saŋ	49, spread
A: san; H: (i-)səna	40, work, cook
A: sari; H: 'səra	13, sick, cure
B: sələm; I: ašwala	7, black
C: sənin, siman; D: sunɪn, simaŋ	24, ant
I: sɛk; K: sik, zik	49, tie, open
Fp: -si; Fc: ci; K: is-	18, heavy, dry, etc.
B: sigge; C: siki; G: šeek, šɛɛk'	2, sand, earth (cf. #105)
I: sik^{h}, cik^{h}, seg; J: gasok'-	19, hear, listen
C: sila; Ek: Sir; En: sɪl	35, chief, drum
G: sili, zili; J: šil-	22, harvest
B: sim(m)i-; D: simmo	26, good, well
B: sire; C: simdi-k, siren-di; D: suul	23, smoke, hearth
A: sisi-ganta; J: -sisi-tima	38, thin (cf. #235)
B: sit(t)as-; E: šidda, sedda; K: tsɪɗ (cf. tudu)	1, all, full, very
B: soele, seili; G: s'oli	36, call, cry
C: sok; J: koš	15, beat, etc.
B: sole; L: -zule ~ -sulɛ, -suli, etc.	5, egg
A: sool; Fp: zuzuru; Fc: sulu	24, bee, mosquito
D: souŋa, sɔuŋa; I: sosom	1, many
H: -'suba; K: saba	12, river, flood
C: sun(u); D: sunu	12, rain
A: suŋgey, suŋgai, suŋgari; B: zuŋgu	44, sweat
D: suŋgo, suŋkop, usuŋ(o); J: soŋwa	40, seed, hoe, iron
H: suu'-da; L: suya	7, evening
š	
A: šAn; B: suN; L: sun+	15, stab, split
B: šeli; C: sirŋii	30, tooth
A: šeri; I: seʔe, sile, zele	47, beads
B: šigar; I: šekir, s'ik'ir, etc.	11, claw, foot, finger
I: šiinbala; J: šin'da	37, wait
A: šimbar, sumbaru; I: šum	11, lame
A: šiŋgyi; J: seŋa, səŋa	48, sour, salt
B: širun, K: tsirim	40, iron
I: šɪgɪn; J: žiiga	13, poor, bad
H: šo(o)da; L: -sodo-	45, bowl, gourd, pot
I: šɔgɔ; J: šooka	40, seed
G: šuk'aa; I: suku(l)	37, wake up
I: šuʔ-an, šiʔɪn; J: šək(wa), šux^{w}	33, breathe
B: šwe, šu(w), su-; I: su(?), cuka	34, two

Sample Citations	Semantic Set, Gloss
S	
Ek: SiN; En: c/siN; H: šiŋa; K: esin	38, few, small, thin
t	
C: taa-; K: tat-	36, spit
B: tac; C: tag, tak; I: tog	6, drink, taste
K: tad; L: taddiŋ	50, lizard
E: tadd-; L: t̲aṭɪ	45, gourd, pot
D: tagam; I: t'akam, tagal	30, lick, tongue, teeth
C: -takal, a-takal; J: taage; K: (i)tak(an)	25, send, gather, get
B: tamai; H: to'ma, 'tom-a	23, fire, flame
K: tamor; C: kamur, kommor, kamali, kamari	21, beard
A: tana; L: t-aani, d̲-ɛɛnɛ	35, baby, bear (child)
B: taŋ; C: taŋga, tʌŋʌl	12, sky, up
C: taŋa; Ek; taiŋ-, tɔŋ-	43, fear, hate, like
B: taŋgaN; C: tan(i); E: Tɛŋ; G: d'iŋɛ	37, sleep, etc. (cf. 81)
B: tap-; K: pad, faɗa	48, bitter, sour
B: tay, ci; C: tai; F: tei; I: di	37, stand, etc.
B: təm-; C: təp-	49, touch
B: t(ə)ra, tilo; C: tar, tiilo; F: teLI, tria; L: tuul	34, one, ten
B: tərəm; I: torom	1, many (cf. #163)
B: təuŋ, tiuŋ; I: a-tende(?), taʔ, t^{v}e, t^{h}e	28, sun
B: tie; F: -di	44, excrement
B: tigi, tuge; D: tigɛ	2, stone, village
B: tiibi, tifi, tihi; I: piti	2, ashes
B: timi, to(m)a-; Fp: tima; Fc: dam	30, tooth, tongue
A: tirfi; B: tefe	13, sad, poor
B: tirra, ti; I: tera	3, bark, skin
K: tisit; Fp: dito, sito	21, tail, worm
I: tiz-; J: teeš	27, forget
Fc: tobi(y)o; I: adop^{h}, dɔɔp^{h}, tɔbɔ	17, lion
B: toe; C: to	34, other
B: tok; C: dɔɔk, tɔɔk, ɪduk	15, beat, etc.
B: ton-; I: toonu	49, spread, put
A: tona, tono; K: taton	20, chin (cf. #255)
H: toofa; L: -tuufo-	31, buttocks, rectum
A: toši, toos; I: tuš, tuš, attuc	44, excrement, urine
B: tɔmb; D: tuum- ~ utum-	40, build, create, do
F: tu, t(r)ɔ; I: tolen, tul	47, name, body, shadow
Fc: tudu, utu; I: tuɗ-uɗ; K: tsɪɗ (cf. sit(t)as-)	1, full, all
B: tul-; I: t̲'ur-	26, wash
A: tuti; J: -tət-, t'ɔɔts	49, push, put
D: tuuru; H: 'durfa; L: nɗaaro, taaru, t̲aaru	19, deaf, leaf

Sample Citations	Semantic Set, Gloss
ɬ	
B: ɬe; I: t'(w)a	30, mouth
B: ɬ(i)a, tea, ca, -za; J: iita, (y)ita	33, nose
tˢ'	
I: (t)ˢ'e(e), se, c'e; J: ts'ea, c'ea	19, ear
u	
Fp: uli; Fc: ulɛ; J: rre, lee, ree	40a, hoe (n.), dig
C: ulun; H: 'ell-a, eer-a	34, one, other
C: un, uŋ; Fc: un(u); L: OnO	25, buy, get
D: uŋɔ; G: aagu, ago	45, gourd
C: -ur; Fp: (m)ara; Fc: ra(a), ɔrɔ	40, cook, work
B: ur(r), wula; C: orro, (w)uro; F: uru	4, belly, heart, etc.
B: uru, oɽu; I: uri	39, spear, stick
B: uru, ura; D: d-a(a)ru, d-ɔr-tu	9, bone
C: uruŋg, uruŋj; K: ar(ir)	23, smoke, flame
Ek: utu; En: itət, (j)it; F: -utu	19, ear, etc.
C: uul-, ulɔ/s; D: (k)ull-, kule, (j)ul	25, transfer
ʉ	
I: ʉf; J: efec', (ɛ)ɛf, afɛts'	26, wash
w	
B: waaga; K: waak	15, swim, play
C: wai; Ek: wVl; En: wel(i)	46, house
C: walak; I: wəl-	40, cook, change, help
A: wani, kwaane, kweane; En: m(w)aan	34, other
A: waŋga, B: wa(n)-, wa-	43, hate
C: was, wus-; L: assu, ussu(?), etc. (cf. *azəx^{w}-*)	27, know
C: (w)aš, wɔš; I: sɔwasɔ	15, stab, pierce
C: wattal; I: wat-	14, follow, run
B: way, wap; C: may	15, hit
B: wer; C: wɛre, weere	15, war(rior)
A: wey, iway; D: wɔye	34, ten
A: wi; C: iy, ɔy; D: a(u)w, wi; F: kui, wui; I: wee, wu	16, die, kill
A: wirtyi, wirci; B: wər-kiti	13, sick
A: wityira; K: widza	7, evening
Fc: wo; H: wa; K: wa?	1, big, full, etc.
Fp: wo; I: wo?	26, wash, clean
I: -wɔk; J: da-wək	23, warm, hot
D: wɔ/ut, u/od/tu; I: wutti, wOt'i, od	23, fire, flame
B: wunissi, winigi; C: 'awun, awendi, awundi	2, ashes

Sample Citations	Semantic Set, Gloss
y	
H: -ya; I: ya(?)	44, sweat, vomit
B: ya(a)-; D: d-ee; E: ai-t, e-t; I: ye-, u-yai	35, man, person (cf. #279)
A: yai, yay, yei; C: yeu(-ndi)	7, cold
A: yari; I: -yala	1, full
A: yeri, yeer-; B: yarake, yaraŋar, yelak	44, vomit
B: yid, cid; C: (i)i(d)	16, die, kill
z	
B: za; Fp: za; Fc: ja	17, fat, meat, animal
K: zɛk'wa, zɛk'wɛt; J: žig-, jig, žik	37, sit, stay, sleep
A: zuku; B: suk, -zuk, -zɔk	49, pour, shake
A: zumbu; B: zam-, zəm-, səm, səp	14, descend, dive
A: zuru; B: zawur, zu-ru, sowur	14, go, flee, enter

G. Fragment Index

This index of the Fragments of F above is arranged first by semantic sets and then by alphabetical order of initial (*a, b, ɓ,* etc.) of the fragments. Since the index is a simple reverse of List F, all the remarks on List F apply here also. The index makes in easy for the reader to answer questions such as: is a form such as *ab-* found with the gloss 'drink'? or what are the forms found for meanings such as 'drink, eat' ?

Semantic Set, Gloss	Sample Citations
1, full	C: biŋga, piŋ, fiŋ(g); E: bɪn-
1, very, many	Fp: da, ɗa; J: da-
1, all	C: dum, tum; H: tumma
1, big, fat	E: duru, duluN; H: turuda
1, very	C: jaŋga; En: ajjaŋ, ca(a)ŋ
1, all, many, etc.	B: kɐr; D: karra; E: k(w)ar; F: *klr
1, far, wide	C: lɛl-ti; F: lolu, olo; K: laluga; L: illur, iiru
1, enough	C: met(te); I: -mota
1, all, enough	I: muuko; L: , +mak, adi-maaku
1, many	C: nol(l)i; I: naala
1, all, full, very	B: sit(t)as-; E: šidda, sedda; K: tsɪɗ (cf. tudu)
1, many	D: souŋa, sɔuŋa; I: sosom
1, many (cf. #163)	B: tərəm; I: torom
1, full, all	Fc: tudu, utu; I: tuɗ-uɗ; K: tsɪɗ (cf. sit(t)as-)
1, big, full, etc.	Fc: wo; H: wa; K: wa?
1, full	A: yari; I: -yala
2, ashes, earth	A: boos, bo(o)su, bosu; B: bašo, bušo
2, thing	H: daa'ta; I: dɛyda, dida; J: da, də
2, stone	D: d-ido; G: dididaŋ; J: dɪdɪgša
2, mountain, stone	B: fadai; C: faila
2, village	B: -fətu-; C: faato
2, ashes, earth, marsh	B: firki, fərgi; C: firgi
2, mountain, stone	A: hɔndu; B: ontu
2, down, earth, sand	Fp: kɐn-; Fc: kaŋa, ɲɛɛ; I: kina, keinə
2, ashes, charcoal	C: kikimi-; F: (k)uk(u); H: (k)uk(us)
2, charcoal	E: (kʷ)ɪlɪd, culu; Fp: kll-; Fc: (k)ɛl-
2, earth, ground	A: lab(u), lebu; H: lafuta; L: naɓu
2, earth, place, thing	B: loo; D: lo; F: loo, lu, lA
2, thing	A: muraad; C: marat
2, sand, earth (cf. #105)	B: sigge; C: siki; G: šeek, šɛɛk'
2, stone, village	B: tigi, tuge; D: tigɛ
2, ashes	B: tiibi, tifi, tihi; I: piti
2, ashes	B: wunissi, winigi; C: 'awun, awendi, awundi
3, bark	D: bɔd-; K: bɔɗ-
3, bark, basket, sack	F: ɓoR; Ek: fur; En: por
3, basket, sack	A: cill; B: celli

3, bark, hide	Fp: ɛnɪ, kyini; Fc: -ana; En: wʌn, waan
3, bark, net	Ek: gabad, kɔbda; En: kaɓunduce; F: gbanda
3, hide, bark	B: gaŋau; I: gwɔŋgi, gwaŋgi
3, basket	B: kele(m), kere; D: gera, keera
3, bark, skin	A: kokosi; B: kaskaši, kuši; K: kus-
3, scar	C: madɐ; H: el'mata (Ar.?)
3, basket	B: reika; L: luka, rukka
3, bark, skin	B: tirra, ti; I: tera
4, belly	G: ayu, iyu; H: kaya
4, belly	E4: ɛl(g); J: (y)ila, iilə
4, navel	Fc: kuɗ; K: gud
4, navel (cf. Latin)	D: ombol; G: abultu
4, belly	I: puma(a), bwa, aɓuun ~ aɓoo-; K: pun-
4, belly, heart, etc.	B: ur(r), wula; C: orro, (w)uro; F: uru
5, partridge, etc.	B: ərgarr; G: miš-ɛrge
5, bird	C: bey, ɓey; G: bɛɛguu ~ beego; L: waay ?
5, bird (cf. #343)	A: ciraw, kyiraw; B: cafori, cɔuri; H: šurka
5, pigeon, dove	C: dɛrɐ; J: dararia
5, bat	A: -firfir; B: forefore
5, egg	A: -gur(i); B: ŋgəBəl, gullu, akora
5, egg	D: -iro; -orda; E: war(r)-; G: hoholo
5, egg	I: is, Is; J: iš(a)
5, fowl, pigeon	B: kogu, koki; C: kokor; E: kog-, F: guku
5, partridge, pigeon	B: kudu; C: ndoko; E: kwott-; F: kuɗ-
5, bird	G: mic'e/ɛ(?); I: a'dadamit; J: mɛta
5, egg	B: sole; L: -zule ~ -sule, -suli, etc.
6, drink	C: ab-; D: ba- ~ -ab-, -ʌb-
6, food, dura	C: assek, asik; K: cek-
6, beer	A: baj; G: baaca
6, porridge, etc.	A: bita; I: binte
6, eat, food	B: bu-, bo; H: 'buʷa
6, beer, thirsty	B: burtu, bur(r)su; G: bur
6, beer, thirsty	B: gio, giu; K: gii?
6, ignite, etc.	C: iliin; H: lee
6, eat	Fp: -ka; Fc: -ak; I: k'a
6, bite, burn	I: kes', kis'-; K: k'edz-
6, dura	B: mardam; D: marga; Ek: marɐ; En: mo/urin; F: maru, muru
6, drink, thirsty	E: mer; G: meera
6, eat, bite	B: owe, wo, u(u); Fp: o?ɔ; Fc: o(o)
6, drink, taste	B: tac; C: tag, tak; I: tog
7, black, evening, etc.	D: arra; E: ur(i), waar; F: iri
7, black, green	A: bi(bi); Fp: -bi; Fc: tibi
7, black, night	B: karedi; H: kare'da

7, night
7, grass, green (cf. #146)
7, black, dark, night (cf. #146)
7, grass, green
7, black, night, evening
7, night
7, black
7, evening
7, evening
7, cold

8, blood, red
8, red
8, yellow
8, blood

9, bone, horn
9, bone

10, breast, armpit
10, breast
10, breast, chest
10, milk, suckle

11, hand
11, head (cf. Iso. #5)
11, head
11, foot, leg
11, thigh
11, ankle, thigh
11, hand, elbow
11, hand, foot
11, hand, arm, foot
11, claw, foot, finger
11, lame

12, hail
12, cloud, rainy season
12, lake, well
12, god, lightning
12, rainy season
12, well (n.)
12, riverbank, lake
12, rain
12, bank, lake, well
12, riverbank, lake
12, water
12, rain, water

C: kosoŋga, kosaŋ; D: kɔsut
C: luho, -lida; E: lawa, luum; F: luwɛ
C: lu(liok), wulo(o); D: lool, lul; F: lu-
En: ɲar; G: ɲeera, ŋeera
C: ɲerem, ɲamble; E: nergi, neegi
E: ode, ood, wide; Fp: -dyo; Fc: (n)dɔ
B: sələm; I: ǎswala
H: suu'-da; L: sʊya
A: wityira; K: widza
A: yai, yay, yei; C: yeu(-ndi)

E4: afad; H: kokoba; I: kapa
B: ma(a)ɾ(a), 'mʌraai; J: mireema
I: mona-, maŋ-; K: muɲan
En: rima; yerm; F: s(r)ama, rama ~ masa

B: (-gu-)ji; C: ka(n)ji; F: kaj-, (ka-)ju
B: uru, ʊru; D: d-a(a)ru, d-ɔr-tu

A: fafa, fəfa, fəfe, fofe; I: bwambi
A: gand-; B: ŋganji
En: iid, wiid; K: ede, eu, ida
B: loo; C: la(a); F: ulu; Fc: l(ɛ)i; G: yeri

E2: ari, iiri; J: eerɛ
A: bom, boŋ; C: bo
B: dau; D: do(w); F: *drU; L: +du
B: dei, dai, dao; K: dɛ(a)
I: d(y)aaša, gyaša, J: c'yeša
C: fakkak; Ek: fokki; En: afuk
A: kamb-; C: gam-, gem
A: kobsi; B: kobe(i)
B: mei(ta), meto; H: minda; I: me/ɛɗ, (m)bi(i)t(te)
B: šigar; I: šekir, s'ik'ir, etc.
A: šimbar, sumbaru; I: šum

B: arururr; L: (indi-)guruuru
C: barti, abir; F: barua, ɓari, gbara
B: belli, billi; D: bel
Ek: beL; En: bar; K: ɓɛlgɛn
B: dabo; H: ada'ba
A: dai, day, dey; B: daidai
A: gurma; J: kurma
I: -jibai; J: 'jamba
A: kaba; C: kobu, kubu; I: (a)gaP; L: kaɓuga
B: kəma; J: gəma
E: ma+ŋ; Fc: man ~ min
A: mi(si)-; B: me, mi; H: -mišida L: (ki-)me, -mɛ

12, sky, rainbow
12, riverbank 2, marsh
12, river, flood
12, rain
12, sky, up

13, sad, poor
13, sick
13, bad, sick
13, sad, sick
13, bad, wrong
13, ugly
13, dirty
13, dirty, rotten, ugly
13, sick, pain, etc.
13, rotten
13, dirty, rotten
13, sick, cure
13, poor, bad
13, sad, poor
13, sick

14, come, enter, etc.
14, fall
14, descend
14, fall, throw
14, go, follow
14, come
14, follow, hunt
14, dive, throw
14, come, go, etc.
14, exit
14, follow, run
14, descend, dive
14, go, flee, enter

15, split, divide, plow
15, break, fight
15, knife, stab
15, axe
15, hit
15, break
15, break
15, cut, etc.
15, fight, etc.
15, knife
15, split, divide
15, swim, cut, hit

G: mosolo, mozolo; L: +masala; +msal
C: papi; Fp: fafa ~ papa; Fc: fafa
H: -'suba; K: saba
C: sun(u); D: sunu
B: taŋ; C: taŋga, tʌŋʌl

C: aikizi; J: gi'ziina
B: aman; K: may
C: bayina; H: ba'ya
A: forgo; B: forge
A: futa; J: puta
C: goititiŋ, D: giti
C: irniŋ; K: riɲɛs
B: jɛnɛ, gein, gined-; C: jin/m-ira-
C: lul(ak); F: lii, lulu, riyi; I: ulula
B: mbəš, -bus; H: ambo(s)-, am'boka
Fp: riri; Fc: IrI, yer; K: ur
A: sari; H: 'səra
I: šɪgɪn; J: žiiga
A: tirfi; B: tefe
A: wirtyi, wirci; B: wər-kiti

C: ac, as; G: að; K: ac, ats
C: bəy; J: bee
G: buθo(?); J: bʊt
B: fi-; F: Pi, pia; I: p(')ɪ?
B: ga-(s)-, g/kas(-ar); H: gas
B: ker; C: akar, ag/kʌr, kar(a)
G: maɗne, amaɗne; I: mata
A: miri; Ek: mir; En: mɪr, mbir-
D: -o, -u; H: awa; J: wai, we(?); K: au
I: $p^{(h)}$ut(i), $p^{(h)}$ʊt(i); J: pəts, p^{h}ets
C: wattal; I: wat-
A: zumbu; B: zam-, zəm-, səm, səp
A: zuru; B: zawur, zu-ru, sowur

C: ar(oŋg); D: (k)arr-, arrɔ
G: bə(ə)š-u; H: -baca-, -bad; J: bats'
B: bebur; H: ulbur-
A: daši, dees(i); B: tasa
A: dur; B: durubi; C: ɪdor; I: dorr
K: ɗus; D: duš
B: fas-; G: fəše
B: gi; H: 'gee-
A: gui; B: gu(a), goi, gərsə, gogo
A: huriew, (san-)huriaw; G: haiyiri
C: kak; I: kwak
B: mba; F: mba

15, hit	C: ɔɔs; J: ɔc
15, war(rior)	G: -p'iluwa; I: -p'ɪ
15, beat, etc.	C: sok; J: koš
15, stab, split	A: šAn; B: suN; L: sun+
15, beat, etc.	B: tok; C: dɔɔk, tɔɔk, ɪduk
15, swim, play	B: waaga; K: waak
15, stab, pierce	C: (w)aš, wɔš; I: sɔwasɔ
15, hit	B: way, wap; C: may
15, war(rior)	B: wer; C: wɛre, weere
16, kill (cf. #197)	B: cejin; K: cɛ
16, kill, die, dead	B: duwa; C: (k)udum; H: tuwa
16, die, kill	B: nɪ; E: ni
16, die, finish	B: nusi, nušiš, (to)nos, nOs; J: aŋoos
16, die, kill	A: wi; C: iy, ɔy; D: a(u)w, wi; F: kui, wui; I: wee, wu
16, die, kill	B: yid, cid; C: (i)i(d)
17, dog	D: assa, E: wɔs, iis, etc.
17, fox, feline	B: bultu; D: borŋo; E: buraŋ; G: bɔɔrid
17, cat, leopard	C: jaro; D: jaara
17, dog	D: kut; K: kudo?
17, lion	En: ŋatu(i)g; K: ŋatuŋ
17, lion	Fc: tobi(y)o; I: adop^{h}, dɔɔp^{h}, tɔbɔ
17, fat, meat, animal	B: za; Fp: za; Fc: ja
18, dry	B: gollu; C: koli
18, dry	A: ko(o)g-(u); B: ko(?)a(i)
18, weak	A: -lagar; B: lagɔ
18, smooth, soft, weak	B: lɛle; ila?; J: -lee-; K: -laɓ, lelɓ
18, heavy, strong	C: lirra, lera, lulu; H: ali'la
18, smooth, soft	C: loboka; H: luluma; L: -lubu, +lɔɓa
18, dry, hard	A: nin-a; C: ninjim
18, dry, hard	B: ŋj-or(d)o, car; C: nojir(r), tejirri
18, heavy, dry, etc.	Fp: -si; Fc: ci; K: is-
19, ear, hear	B: bas; K: bos, bes
19, hear, deaf	A: beeb(e), bemɓaw; K: bub, ibubisa
19, leaf (cf. dɪfɪn, 'hair')	Ek: defene; En: teffa; H: fefena
19, deaf, dumb, leaf	C: dɛre, dari; E: terig, derug
19, ear, hear	C: ɛr-; D: -il; G: ille
19, ear, leaf	A: haŋ(g)a, koŋgu; I: haga
19, hear; 27, know	B: karaan, kərənn-; D: kəl-, kɛl-; G: haala; I: -kara(n)
19, ear, leaf	C: koŋi; H: uku'ne, ukun-a
19, ear, leaf	A: koos-; C: kozam
19, leaf	B: lambo; K: rɔ(ɔ)m
19, deaf, dumb	A: lut(aw), lutug, lutuw; D: ulul
19, hear, listen	I: sik^{h}, cik^{h}, seg; J: gasok'-
19, deaf, leaf	D: tuuru; H: 'durfa; L: nɗaaro, taaru, ţaaru

19, ear	I: (t)^{s}'e(e), se, c'e; J: ts'ea, c'ea
19, ear, etc.	Ek: utu; En: itət, (j)it; F: -utu
20, face	B: bɛrɛ, bɽi; C: abɪr
20, chin	B: gegeno, gingel; C: ɲɛgedamu, ɲɛgɛgemi
20, chin	I: gik'iš, gigiši; J: zakiisa
20, eye, tear of	C: kal; D: kola
20, face, cheek	A: -kandu; B: kindu
20, blind	D: kuuru; Fc: kulu
20, face	B: kwi; I: kwi-ji
20, cheek	B: ŋuoli, ŋola; C: ŋgaiyo
20, face, cheek	C: pul; D: fula
20, chin (cf. #255)	A: tona, tono; K: taton
21, tail, penis	C: auwəl; ɔlu-k; I: wul, uul-
21, hair	F: ɓi-; J: be(e)
21, hair (cf. defene, 'leaf')	B: dɪfɪn; C: tifi-k, teefa, tiifa
21, tail, penis	Ek: eb, ɛb; En: iib-(t)e; G: abəro; H: e'ba
21, root, tail, worm	B: fire, fɪr; D: furu; E: fil-, fer-; G: fiili, wiili
21, root	C: fou; I: fu
21, worm, root, snake	Fp: muri; Fc: mur-; G: amuɗu
21, snake, tail (Core iso. ?)	D: n-u(u)m; I: oŋo, uunNu; L: (i)nni, pl.: nooni
21, penis	B: ŋgur; G: gure
21, feather, beard	B: ofori; D: furo
21, rope, beard	D: ɔŋo; L: b-oroŋo
21, beard	K: tamor; C: kamur, kommor, kamar/li
21, tail, worm	K: tisit; Fp: dito, sito
22, bamboo	I: at'^{h}e; J: 'ŋt^{h}a
22, flower	C: buraga; J: bɔrg^{y}a
22, flower	D: dure; L: (n)duli(k), tulɪ
22, baobab	A: ko; B: kuwa
22, beans	C: kukurum; I: yakuru
22, harvest	G: sili, zili; J: šil-
23, warm, hot	G: bəɗi(?), boɗi(ʕ); I: ɓath, Bat, ɓəs', ɓas(')
23, warm, hot	A: dung-; H: daŋo-
23, smoke, fire	Ek: go(o); usug(u); Fp: ŋga-, ŋgɔ, ugu
23, warm, hot	I: -kaga(?); J: gawkog^{w}a, maakog^{w}a
23, fire	En: ma(a)(+t); J: mand^{y}a, maan/ɲja
23, fire	A: nuna, nune, nuun; B: wueni, win(i), wun(i)
23, smoke, hearth	B: sire; C: sirndi-k, siren-di; D: suul
23, fire, flame	B: tamai; H: to'ma, 'tom-a
23, smoke, flame	C: uruŋg, uruŋj; K: ar(ir)
23, warm, hot	I: -wɔk; J: da-wək
23, fire, flame	D: wɔt, wut, utu, odu; I: wutti, wOt'i, oɗ
24, ant, bee, etc.	B: adi; D: de(i); E: (u)di, ote; F: iTi
24, ant, termite	D: dwaŋ; K: da(a)ŋ

24, bee, honey
24, fly, mosquito
24, louse, mosquito
24, ant, termite
24, fly, mosquito
24, ant
24, bee, mosquito

25, transfer
25, carry, send, etc.
25, gather, give
25, take, steal
25, buy, sell, hold
25, catch, take
25, transfer
25, bring
25, transfer
25, transfer
25, send, gather, get
25, buy, get
25, transfer

26, good, happy
26, good, right
26, happy, pretty
26, good, well, sweet
26, wash
26, happy, good
26, good
26, pretty
26, good, well
26, wash
26, wash
26, wash, clean

27, know (Core iso. ??; cf. *was)*
27, forget, lose
27, watch, guard
27, see
27, intelligent
27, know, stupid, dream
27, see, watch
27, forget
27, know

28, moon, sun
28, after, before, etc.
28, after, back, behind

I: kaas, gajeb, gəyɪb; J: kaca, kɛca
B: kantana; H: an'tɛna, attɛna, atan-a
D: kɪa, I: ki
B: meliu, moli; En: mUr, F: meri; G: more
A: ndeŋ, ndiaŋ; B: cigə, nde(g)i, ntɛgi
C: sənin, siman; D: sunɪn, simaŋ
A: sool; Fp: zuzuru; Fc: sulu

C: adaw, ndəw, nduo; E: ɖawi, ʈaal, t/ɗaaw(a)
D: bau, abu; F: Bu, ɓ(w)o; I: ab, bwi
A: daŋ-; L: adaŋ
B: go, gɔ; C: goo, gwiyɛ, guyɛ
K: gug(u); I: gwɔg
C: irimʌn, irinn; D: ir, ri, ɪrri; F: ri
C: kar(a); I: kar, kɛr, kɛɛle, kal-
B: keb, geb; I: ka/əbakəp, kapikəp
C: naus, naw(s); H: nau-, nawda; L: na(a), nna
C: ne, nə; Fp: ne; Fc: (-)ni, -ne
C: -takal, a-takal; J: taage; K: (i)tak(an)
C: un, uɲ; Fc: un(u); L: OnO
C: uul-, ulɔ/s; D: (k)ull-, kule, (j)ul

A: dago(n)-; I: diga?
F: -dili, -dir; L: aɗiila, aɗula
B: faše; H: 'fase
B: kada, kad(d)a; C: kodo-k, kodda
B: lam-; I: lam(-)
C: maŋ(-ndi), maŋyi, maniŋ; J: maaŋaniila
C: nasi-se; H: 'nes-a
C: -ɲere; L: -aaɲerri
B: sim(m)i-; D: simmo
B: tul-; I: ʈ'ur-
I: uf; J: efec', (ɛ)ɛf, afɛts'
Fp: wo; I: wo?

J: azəx^{w}-; K: ec-, (i)yes, yec, iɬye; L: as(s)u, (y)ussu
H: -bə'le; K: ibileron, ber-on
C: dum-; G: do'ma
A: guna, guLa; K: gon-
C: jiilitii; J: žijiləcə
B: miše, miši(-de); I: meš, miš
C: oko, yako; F: -kO
I: tiz-; J: teeš
C: was, wus-; L: assu, ussu(?), etc. (cf. *azəx^{w}-)*

En: ag(u)wa, koo?, kau; J: (o)ka, wɔɔka
A: alula; C: iluk, lyun; F: LɯN
C: baŋgadɛdɛ; I: -pɔk, ap^{h}o; J: -booŋu, bɔŋwa

28, star, bright
28, before, morning
28, star
28, dry season
28, time
28, yesterday
28, yesterday
28, after, morning, etc.
28, day
28, moon, star
28, sun, star
28, sun

29, because
29, yes
29, perhaps, then

30, lip, language
30, lick
30, lip
30, tongue
30, lip
30, teeth
30, tongue
30, tooth
30, lick, tongue, teeth
30, tooth, tongue
30, mouth

31, neck, back
31, neck, shoulder, etc.
31, vagina, buttocks
31, shoulder
31, neck, buttocks
31, back (of body)
31, neck, throat
31, buttocks
31, back, neck, shoulder
31, neck, back
31, buttocks, rectum

32, old
32, always, now
32, always, now
32, old
32, slow, fast, etc.
32, old person
32, fast, slow (cf. #321)

B: bələmma, bar(r), bɔli; J: bal
B: bilia; K: billi
I: bizɪɛn, bizɪɛn, biiza; J: bi(i)ža
B: borro, boru; K: ɓor
A: haaŋ; G: aŋ
K: kaka; I: ikɔk
D: kɪt; I: kaʈi(i)li, kɛʈi(i)li
D: liiya, le(l); I: yilan; K: ɬiŋat; L: aliili
J: maaŋwa; K: maaka, mayka
C: medding; L: -maɖagɛk, miɖigi, etc.
C: mɛn-, miɲ-; E: mwiɲji; G: mənjo?
B: təuŋ, tiuŋ; I: a-tende(?), ta?, tʸe, tʰe

C: genen; I: gənna
C: hen; G: hiin
B: kuwa; I: kuwas

A: -bena, -beena; Ek: baŋɲid, bena
B: gan-; K: kan
A: -ganda; B: gandi
G: kal-, hal-; H: kal-a
C: -maɗa; L: -modo
B: margE, mʌrgɪ, murgE; C: marga-k
E: ŋaR, NaL-; H: ŋe(e)l-a
B: šeli; C: sirɲii
D: tagam; I: t'akam, tagal
B: timi, to(m)a-; Fp: tima; Fc: dam
B: ʈe; I: t'(w)a

B: bədi; H: bə'da
B: diddi; K: udud, doɗa, dod
C: diile, ndir; Ek: ʈɪrr, ʈuru; En: tiiri
C: gaata; I: gəti
B: girri, hɪllɪ; C: kirm; L: +(ŋ)gir
Ek: jEr; K: 'jera
A: mor; K: mOrut, mɔrɔk, morok
B: murdʊɪ, mere; L: -mooroŋ
B: ŋgavo; C: ŋgaba; F: gbagba
C: pore; G: bɔɔlɔ(?); L: baraŋ
H: toofa; L: -tuufo-

B: baine, baɲe; D: bain
C: bəŋ; F: (ŋg)ban(e); I: baŋ
D: bitaaŋ; L: bitiŋɔ
B: bode; D: bedɛ; G: p'eɗɗo
B: dira?; C: nder; F: dVr; L: -daru
F: -go; I: gə-
B: kololo; C: cɛlɛlo, iro; F: le, -lo

33, smell — B: bas; C: abus
33, nose — C: bɔŋ, (m)boin; H: boßo'na, bubun-a
33, lung — H: -ßabʌ; J: bafa
33, nose — C: durmi; D: d-ormi, d-ɔrmi, gorna, gurna
33, wind, storm — B: karwa; C: kurunda
33, nose, smell (cf. #315) — B: mangu; D: maaŋ, -imeŋ-
33, smell — En: ŋua; Fp: -ŋgU
33, breathe — I: šu?-an, ši?ɪn; J: šək(wa), šuxʷ
33, nose — B: ʈ(i)a, tea, ca, -za; J: iita, (y)ita

34, four — C: 'asaal; H: sal'le, salle
34, ten — K: ßodok, mɔk; D: bɔk
34, three — Fp: ßutɛ; Fc: muta; G: muuθe, moudi?
34, twin — H: ga'ge; J: gwaaŋ-guja
34, five — A: (g)gu, iggu; B: (w)ugu, uwu
34, other, stranger — A: gyina; J: g(ʏ)Enda, gindi
34, other, stranger — D: ke(e)r, kɛr; H: kee'la
34, five, ten — G: mduma; L: (i)idu(m)mu
34, one, other — F: ŋg(b)a; L: ɲuŋwa, iŋwa
34, two — B: šwe, šu(w), su-; I: su(?), cuka
34, one, ten — B: t(ə)ra, tilo; C: tar, tiilo; F: teLI, tria; L: tʊʊl
34, other — B: toe; C: to
34, one, other — C: ulun; H: 'ell-a, eer-a
34, other — A: wani, kwaane, kweane; En: m(w)aan
34, ten — A: wey, iway; D: wɔye

35, friend — B: aman; I: mono
35, person — A: boro; B pl.: baru; I: burun
35, baby, child — B: doga, dagar; D: dogala
35, boy, friend — C: -(e)mba; F: mba; K: ɛbam
35, baby, girl, woman — B: fero; C: fara, fel; G: p'iir
35, child, baby — C: gai, kai-; D: kwe; G: gɔɔ, gwi
35, person, man — B: kwa-; D: pl. ku(w)a; H: ka; L: ka, kaau, kɔ(yɔ)
35, woman, wife — B: mi(yik); C: misik, miyik; G: pl. mihi
35, woman, girl, baby — C: muš-aŋ, mac, muooŋ; G: muše/aŋ, mušahar
35, chief, drum — C: sila; Ek: Sir; En: sɪl
35, baby, bear (child) — A: tana; L: t-aani, d-eɛnɛ
35, man, person (cf. #279) — B: ya(a)-; D: d-ee; E: ai-t, e-t; I: ye-, u-yai

36, cough, spit — B: afi; K: ɔf
36, say — H: ake; L: (ak)ki, ikki
36, laugh, song — C: ale; D: all- ~ la-; J: alo(o), aro
36, say — D: bel-; L: abɪrɪ
36, curse — B: bosku-; G: bɔš
36, ask — G: ɗɔk'ɔθa; H: tokka-da
36, tell, lie — A: fiila; D: fiiyɛ
36, talk, insult — C: liŋ; F: lem, rem; L: alɪna
36, lie, word — G: ŋɛlu; H: ŋee'ro-, iŋera, aŋera

36, call, cry — B: soele, seili; G: s'oli
36, spit — C: taa-; K: tat-

37, wait, sleep — A: bat-, batu; I: bat-
37, stand, wake up — J: bəəŋ?; L: obuŋi, ɔbu
37, sleep — C: bia, (a)bi, ibi; L: -biiyu
37, stay, live (dwell) — B: boscęk, buscek; J: bəc'ɛš
37, wake up — A: dirgasandi; H: targa-, tirg-
37, stay, live, stand — A: kai, kəy, key, gaay; B: hai
37, sit, stay, stand — C: ɔŋg, uɲuŋg; D: -ɔ/oŋ, -uɲu; K: ɛɛŋ-, eaŋ
37, live (dwell), sit — D: salla; I: -zal, zizɛl
37, wait — I: šiinbala; J: šin'da
37, wake up — G: šuk'aa; I: suku(l)
37, sleep, etc. (cf. 81) — B: taŋgaN; C: tan(i); E: Tɛŋ; G: ɗiŋɛ
37, stand, etc. — B: tay, ci; C: tai; F: tei; I: di
37, sit, stay, sleep — K: zɛk'wa, zɛk'wɛt; J: žig-, jig, žik

38, thin (Core iso. ??) — I: aarus; L: orri, ʊrri, ʊʊrʊʊri
38, thin, short — D: but(t)e; I: pwɔta
38, small, short (cf. *ɗugo*) — C: -deɛkal, (n)dak(k)alak; D: dokella, dokɛlla
38, short (cf. *deɛkal*) — G: ɗugo, ɗogo; L: aduŋo, +ʈugu
38, thin, small — H: -kiša; J: -kɛš-
38, thin, sharp — C: niniŋ-; Ek: (k)iɲiN
38, small — A: ɲɪl; C: ɲelik
38, few — B: ɲjaŋg, njok; C: ɟkɔ, jɛkwɛ
38, thin (cf. #235) — A: sisi-ganta; J: -sisi-tima
38, few, small, thin — Ek: SiN; En: c/siN; H: šiŋa; K: esin

39, forest, woods — B: ʌsɔi; C: ʌsʌk, ʌse
39, bow — C: fida-k; H: fi'tiga
39, tree, (fire)wood — B: idi; K: edis; L: +aadi, +aɗi
39, forest, tree — B: kaan, kana; Ek: Kaan; En: kɛ(ɛ)n
39, arrow, spear, stick — B: kapi; D: kobi; L: kʊʊfi
39, shield — B: kifi, kihi; I: kep
39, stick, shield, spear — En: lɔŋɔn; Fp: laŋ(g)a, Fc: Laŋ(g)a
39, stick — I: -luk-gas; J: lakoza, 'laakɔza
39, spear, bow, arrow — I: p'is, p'ist'iya; K: ßis, bis-
39, forest, woods — C: -riji; K: rɛ?, (r)rija
39, medicine, poison — A: safar(i); B: safarog
39, spear, stick — B: uru, oɽu; I: uri

40, hole, cave, dig — C: agu, ɪgu; Fp: kugu, kɔrŋuɛ; Fc: gU
40, make, help — D: -ana, -a(u); Fp: ana ~ una; Fc: n(d)aa
40, work, change — A: far; B: fərkuso, fal-
40, work, cultivate, build, do — C: -ir; K: (?)ir, er, rija
40, do, make — B: kais, kəis, I: k'oz-
40, begin, start — H: 'koli; I: ma-kula
40, hole, dig — B: la; C: laa
40, dig, hide — B: lus, losku-; I: lus-

40, seed
40, build, do, cook
40, work, cook
40, seed, hoe, iron
40, iron
40, seed
40, build, create, do
40, hoe (n.), dig
40, cook, work
40, cook, change, help

C: ɲɛma; K: kiɲom, kiɲɔm-
C: oaak; I: -wɔk
A: san; H: (i-)sɔna
D: suŋgo, suŋkop, usuŋ(o); J: soŋwa
B: širun, K: tsirim
I: šɔgɔ; J: šooka
B: tɔmb; D: tuum- ~ utum-
Fp: uli; Fc: ulɛ; J: rre, lee, ree
C: -ur; Fp: (m)ara; Fc: ra(a), ɔrɔ
C: walak; I: wəl-

41, cow, buffalo
41, bull
41, goat, sheep
41, calf
41, cow
41, calf

F: bi, kobi; I: ib, pip, beb, piʔi
H: buta, buu'ta; G: budu, bɔdɔ
A: hancin, kancin; B: kaɲi, kanem, hanne
A: hand-; B: kɔnna, kɔnara
A: haw(u), hao; D: u(u), yu
K: kɔb, koc; I: -kap

42, right (hand)
42, round, crooked
42, crooked, left
42, round
42, round

I: dok'ɔm; J: -dɛkʲa
B: gene-te, gən, gin; I: gɛɛŋɛ
Ek: kondon; En: ka(a)nt/ŋ; I: kwɔndɔl
G: k'uɗuk'u; K: dukuɗᵃ; L: (a)ɗuguu(lu)
D: -orol; H: ora

43, want
43, like, love, want
43, like, love
43, fear
43, fear
43, fear, hate
43, fear, hate, like
43, hate

B: bura; I: baara, bəra, bark(e)
C: ikir, ijir, irkɛr; D: giraw
C: juŋ; D: -ɔyɪŋi
B: kaigə; I: koʔ-, kwɔg, kogw-, kukwakwa
D: keli-; H: 'kailo
B: ru; F: -ru, -ro
C: taŋa; Ek; taiŋ-, tɔŋ-
A: waŋga, B: wa(n)-, wa-

44, excrement
44, vomit
44, excrement, dung
44, urine
44, urine
44, excrement
44, sweat
44, excrement
44, excrement, urine
44, sweat, vomit
44, vomit

F: ɖu(ɛ); L: uuɖu, t-ooto
C: itek, ət; H: (u)uta
H: ka'fa; L: koofo
B: kwosu, kuso; K: kwacik, kwats, wac
B: namusu, namusə; C: musu(k)
C: ɲɲi, eɲi, aɲi, uŋyi; E: ɲi, ɲɔ
A: suŋgey, suŋgai, suŋgari; B: zuŋgu
B: tie; F: -di
A: toši, toos; I: tuš, tuš, attuc
H: -ya; I: ya(?)
A: yeri, yeer-; B: yarake, yaraŋar, yelak

45, pot, gourd
45, gourd, boat
45, gourd, pot
45, gourd, pot, bowl

D: ala; L: allɔ, halla
C: aŋgab, aŋgak; H: 'aŋkwa
B: dut(u); D: duTe; E: diide; K: dud
B: ɛdɛ; I: twei, tsi, ti(a); J: dɪɪ

45, gourd, bowl
45, boat, bowl, pot
45, gourd, bowl
45, gourd
45, gourd, pot (loan?)
45, bowl, gourd, pot
45, gourd, pot
45, gourd

A: gasu, gaas(i); D: ka(s)sa
H: 'gonta; I: goono, kono
B: koše; E: kose, kosi, gusi
J: maat'ea; K: mad-
C: sakan(a); H: sekena
H: šo(o)da; L: -sodo-
E: tadd-; L: ṭaṭɪ
D: uŋɔ; G: aagu, ago

46, house, roof
46, door(way)
46, granary, house
46, house, shed
46, house
46, door(way)
46, fence
46, fence, roof
46, bed
46, fence
46, road
46, mat, carpet
46, house

B: beʔ(a), bɪɛ, bei; J: ɓi-, bii-
En: bɪlgɪɲ, ɓiliŋ; L: mbiligi
A: bo, bua; B: bo
A: bugu, bukk(a); B: boŋgo
H: dama; C: -daŋa
A: daŋgal; H: dag'ga
C: esik; K: ɛskɛk
A: kak; I: kak
B: ki(i)r(i); L: -kirya-
C: kulɛ; Fp: huru; Fc: kuri
J: -ndoa; K: od
B: raga; C: raja
C: wai; Ek: wVl; En: wel(i)

47, cotton, clothes
47, name, body, shadow
47, dress
47, clothes
47, beads
47, name, body, shadow

E: baŋ, abaŋ; Fp: boŋgɔ, vɔŋg(w)ɔ
B: cur-, sur-; C: asur; D: suur, culuk; G: s'us'ul
A: -daŋ; C: andoŋg-
C: kusii; K: kus
A: šeri; I: seʔe, sile, zele
F: tu, t(r)ɔ; I: tolen, tul

48, sour, bitter
48, bitter, sour
48, bitter, sour
48, salt
48, bitter, sour
48, sour, salt
48, bitter, sour

En: bebel, mpɪpɪl; I: abeeb
F: d(r)a, ata; L: adiiri, aduulu
A: hottu, hotta, horto, hotu; B: kuttu
B: iare, iɛre; D: er(r)a, warat
B: sai; I: s'ɛʔ
A: šiŋgyi; J: sɛŋa, səŋa
B: tap-; K: pad, faɗa

49, open, shut, marry
49, open, shut, tie
49, tie, sew
49, open, tie
49, put, pull
49, push, etc.
49, push
49, shut
49, tie, sew
49, shut, close
49, pull

F: aji, ija; K: aj
A: dabu, daabu, doɓu; I: -dabə
B: dar; C: darap; L: eɗɔɔlaana, aɗalaana
C: dek, tɛk; I: dɛk
A: deki; D: tik-
D: -ell-; F: (E)re
I: gəᶜʰ; J: gɛk, gɛk'
A: gum; B: kəm-
A: guri; guur; C: guuli; D: -ugul; G: gora
B: jak; C: -dak
A: kas-, kosu; B: kas

5. Comparison with E

5.1 Introduction

Here I present a
my N-S classification
Ehret. Unfortunately
will have to use the ol
article. The ms. consis
ion of Proto-Nilo-Saha
extracted from the list
Saharan Cognate Sets"
identified" (31A). The
chosen from among th
they are generally unc

A comparison of
our findings: section 5
5.4 I survey Ehret's pr
items given in Ehret m
support for the classifi
of his proposed phonc
two very dubious pre
consonant inventory.
reanalysis.

5.2 My Best Isoglosse

I thought that loo
List A.1 above in Ehre
to be the case. In fact,
7 were found but not
which could be combi

In presenting Eh
of his un-numbered lis
ventions of this volum
1.4.2.1. above) to make
the structure, I present
following exposition.

The following are
glosses at the various
been made for particu
adequate.

Ehret's N-S consi
Gumuz) on the one ha
(Central Sudanic) plus

5. Comparison with Ehret Classification

5.1 Introduction

Here I present a much more detailed comparison than found in 1.4.2.1 above of my N-S classification with the only serious competing one, that of Christopher Ehret. Unfortunately I do not have access to the revised version (Ehret Forth.) so I will have to use the older typescript one (undated ms., but ca. 1984) plus Ehret's 1989 article. The ms. consists of two parts: a 51-page text "The Phonological Reconstruction of Proto-Nilo-Saharan" and a 420-page untitled list of starred forms.[1] Examples extracted from the list are given on pp. 31B-49 of the article as "Sample List of Nilo-Saharan Cognate Sets" and "a small selection out of the total corpus of roots so far identified" (31A). The examples are somewhat modified from the list and they are chosen from among those with the highest numbers of representative families, but they are generally unchanged insofar as the criticisms of 5.4 and 5.5 below apply.

A comparison of actual proposed reconstructions reveals a wide divergence in our findings: section 5.2 based on my best isoglosses and 5.3 based on Ehret's best. In 5.4 I survey Ehret's proposed isoglosses as a whole and find that the more than 1200 items given in Ehret ms. and the semantic arguments of Ehret 1989 provide no real support for the classification given in his 1989 article. Finally I look into the nature of his proposed phonological correspondences (5.5) and find them to be based on two very dubious premises: the nature of the proposed family tree and the proto-consonant inventory. Nevertheless, this work contains much of value for future reanalysis.

5.2 My Best Isoglosses as Reflected in Ehret's Work

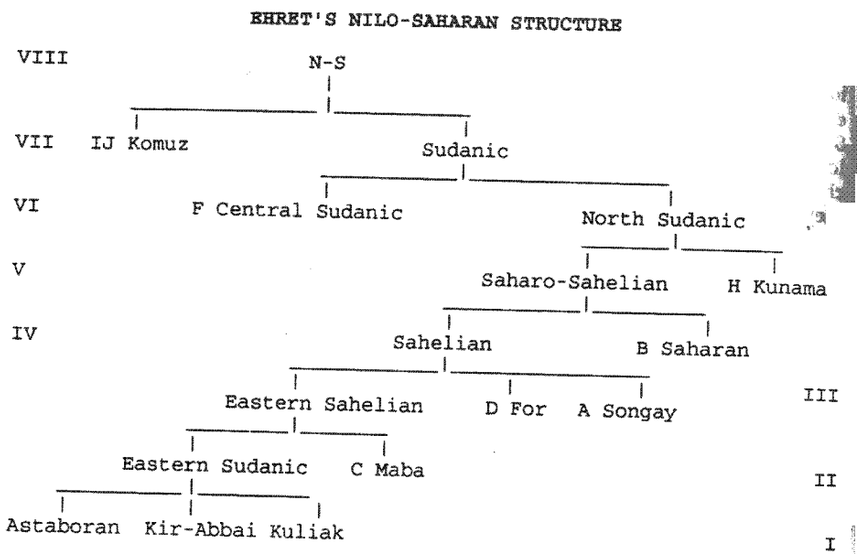
I thought that looking for the reflections of my 16 "excellent" (**) isoglosses of List A.1 above in Ehret's work would show nearly total overlap, but this proved not to be the case. In fact, more than half of them (9) were not found in Ehret's list at all, 7 were found but not as isoglosses, and one is divided between two of Ehret's items, which could be combined into an isogloss.

In presenting Ehret's examples, I will refer to them by my own page-numbering of his un-numbered list. I also take the liberty to condense his items, following conventions of this volume. However, I will use Ehret's N-S structure (as given in 1.4.2.1. above) to make decisions as to isogloss status. Because of the complexity of the structure, I present here (next page) a diagrammatic version for reference in the following exposition.

The following are suggested as reasonable requirements for establishing isoglosses at the various levels. These are intended as generalities. Once a firm case has been made for particular correspondences, less evidence may be accepted as adequate.

Ehret's N-S consists of two top-level subgroups: I-J "Komuz" (i.e. Koman plus Gumuz) on the one hand and "Sudanic" (Sud.) on the other. Sudanic consists of F (Central Sudanic) plus everything else (called by Ehret "North Sudanic"- abbreviated

No. Sud.). This means that for an item to count as an isogloss for N-S, it surely must occur in both I-J and either F or No. Sud. or both. It is easy to check I-J and F, but No. Sud. is extremely complex and I have not yet found an item which is truly characteristic of No. Sud. in Ehret's list. Starting from the top down, I will refer to an N-S isogloss as "Level VIII" in Ehret's classification.



See 5.3 below for details of the Level I groups.

North Sudanic consists of H Kunama and the rest, called "Saharo-Sahelian" (S-S, Level V). It is easy to check F and H under North Sudanic to find a level-VII isogloss, but I have not found an item in Ehret's list which is truly characteristic of the complex S-S group as a whole.

A Level-VI isogloss must be found in both H and S-S. S-S (Level V) is very complex, having two subgroups: B Saharan and "Sahelian" (Level IV). It is easy to check H and B for a Level VI isogloss. Sahelian is complex, having three subfamilies: A Songay, D For, and Eastern Sahelian (Level III). It is easy to check Level IV using B and both A and D.

Level III is Eastern Sahelian and is hard to check because, although C is easy, the other member, Eastern Sudanic (Level II) , is complex. Thus, A, D, and C will suffice for a Level III isogloss. Eastern Sudanic (Level II) has three parts: "Astaboran" (E1,3,7- my Ek without E5), "Kir-Abbaian" (Kir: my En plus E5 and Jebel: E4 plus G Berta), and K Kuliak. For a Level-II isogloss, two or all three of the sub-families are required. Level I families require a majority of each sub-family: Astaboran: two or three of E1, E3, E7; Kir-Abbaian: both Kir and Jebel; Kuliak: two or three of Ik, Soo, Nyangi.

The above may seem confusing because of the complexity of the family tree, so that a summary is in order. In order to achieve isogloss status at the various levels, the following "ideal" or practical combinations are needed:

Level	Ideal	Practical
VIII N-S	IJ and Sudanic	IJ and F
VII Sudanic	F and No. Sudanic	F and H
VI No. Sudanic	H and Saharo-Sahelian	H and B
V Saharo-Sahelian	B and Sahelian	B and A and D
IV Sahelian	2/3 of A, D, and Eastern Sahelian	A and D
III Eastern Sahelian	C and Eastern Sudanic	Same
II Eastern Sudanic	2/3 of Astaboran, Kir-Abbaian, Kuliak	Same
I	See above just before this table.	

"Excellent" isoglosses of List A.1 which are not found in Ehret's list (or are scattered among items in a way that I did not detect) are #3, 4, 8, 9, 10, 11, 12, 13, 15. The following items of List A.1 are found, given here with page refs. to Ehret's List or to the accompanying text (T). Abbreviations are to my units.

#1 ***ar+* 'belly, etc.'
p.362: **aare* 'intestines'
K: **arɪ*
H: *ar+da*
E1: Dongola: *aarɛ*
'interior, inner part, inside'

#2 ***ar+* 'rain, etc.' (T40 as **har-)*
p. 302: **ʔár* 'rain'
A: *hárí* 'water, rain'
D: *ərə*
E: *Ek: E1,5,7 and E4,9

#5 ***+bi ~ +bo* 'wing, etc.'
p.17: **(a)bí* 'upper arm'
B: *bìví*
C: *kabi+k* 'armpit'
I: T: *àbí* 'upper arm, wing, branch'

#6 * **bo* 'many, etc.'
p. 6 (and T31B) **ɓoɓ* 'be much, many, extensive, big'
A: *boɓ+ɑw* 'very'
K: I: *ɓoɓ* -'be deep'
F: **ɓo* 'be big'
H: *bub+ia* 'all'
E9a: Shilluk: *bop* 'large'
p. 19: **bɔ̀* 'big'
B: Daza: *bọ, bu*
F: **bɔ̀*
G: *bɔ+i-* 'get fat'
J: *o+bo+ma*

#7 ***bo/an* 'ashes, etc.'
p. 21: **bù* 'ground'
K: **bu* 'dust'
F: **bù* 'land'
E1: Dong.: *bun* 'bottom'
E2: Me'en: *bwii* 'earth'

#14 ***nV* 'say, etc.'
p. 79: **nɛ̄ɛ?* 'say'
A: *nè*
B: K: *nyì+mé* 'conversation, to talk, converse'
F: **ni*

#16 ***+tI+t+* 'fall or descend, etc.'
p. 232: **TeT* 'teach to walk'
A: *tété*
H: *tate-*

Only one of the Ehret items attains isogloss status at any level if we accept reasonably stringent criteria. The one exception is #6: combining the two Ehret items creates an N-S isogloss since it includes J and F. Note that Ehret inconsistently includes F in both of his two items, once as **bo*, once as **ɓo*. Level VII also applies because of the inclusion of both F and H. Level VI follows with H and B. The combination of representatives from Ehret's Jebel (G), "Kir" (E9a Shilluk), and K might qualify as an "Eastern Sudanic" isogloss at Level II, but C is missing at Level III, D at Level IV.

In #1, one might consider taking K and E1 as constituting evidence for "Eastern Sudanic" status, but I would not accept the single E1 example as being strong enough for this. For #2, the Ehret items constitute a Level IV isogloss since it includes A and D. In #7, inclusion of E1, E2, and K could be considered as (weak) evidence for "Eastern Sudanic" status, but certainly no higher isogloss is possible on the basis of the items given.

#5, 14, and 16 are typical of the problems of finding isoglosses with such a tree structure. Since most levels have a simple group posed against "everything else", it is easy to check the simple groups, but rare to find enough representation further down to support the "everything else" branches. For example, #5 has BCI, #14 has ABF. All of these (BCI in the first case and ABF in the second) are at different levels and none has the representation in the complementary branches.

The differences result mainly from different decisions about what constitutes plausible phonological correspondences. But other considerations enter, e.g. in the case of #1, it seems that Ehret simply missed B Tubu and representatives of Ek other than E1 Nubian. The "semantic polarization" I accepted to allow inclusion of C Aiki

'outside' is risky. Perhaps *ra, ya* (A Songay) is not acceptable under Ehret's criteria and also *+la* in Gumuz, but my experience with numerous examples puts these together.

My combining of *bi* and *bo* in #5 may have been a wrong decision, as may have been Ehret's splitting of my #6 into two sets. (Note **bo* 'head' on p.18, found in AKCHI, not an N-S isogloss in Ehret's scheme, but in mine if one accepts the doubtful pair A *boŋ* and K Ik *ɔb* 'cheek'). My #7 always includes a nasal final and may not be really comparable to Ehret's *bu*, although Ehret accepts E1 *bun*. My #14 is much more adventurous than Ehret's corresponding item, essentially reducing the morpheme to *-n-* rather than *ne ~ ni*. Finally, Ehret's #16 is very specialized semantically and it seems that he missed the more intreresting wider-spread form.

It may not be possible to arrive at clearcut criteria for allowable semantic range (see 1.1.2.3 above), so phonological regularity must take precedence. Experience in analyzing the data of particular language phyla and geographical regions is the best pragmatic guide to semantic decisions and certainly various investigators must respect differences of opinion in these matters. I call on more neutral outside observers to weigh the evidence and contribute their input to the ongoing process of comparative Nilo-Saharan.

5.3 Ehret's Best Isoglosses as Reflected in My Work

Here I am being a bit presumptuous since I do not have Ehret's explicit judgments as to isoglosses. I am basing "best isoglosses" on my own analysis of the data he presents.

I went through and sought those examples having widest representation of the 12 families I identify: A Songay through L Kadu. Ehret did not include the last-named family. He mentions (ms. 30B) that the idea of Kado as N-S can now be tested as a result of his reconstructions- perhaps this will appear in the published version. Other differences between our systems are: Ehret combines I and J as [extended] Koman or "Komuz". E East Sudanic is structured differently by Ehret as follows (including Berta and Kuliak, which I do not consider to be East Sudanic):

a) Astaboran: E1 Nubian, E3 Nera, E7 Tama,
b) Kir-Abbaian:
Jebel: E4 plus G Berta
Kir: E2,4,5,6,8,9
c) Kuliak

Thus, application of my system to Ehret's list introduces some distortion, but I think it has no little or no effect on arriving at the "best" N-S isoglosses for reasons which will become clear here and in 5.4 below. For "best isogloss" in Ehret's list, I used two criteria: i) being found in both branches of Ehret's scheme (I-J "Komuz" and F Central Sudanic as explained in 5.2) and ii) occurring in 6 to 8 families. Only one is found in 8 families and none is found in more than 8. I discount occasional occurrences in parts of E East Sudanic below the level which I use for isoglosses (two or more of Ek members E1,3,5,7 and three or more of En: E2,4,6,8,9).

5.3.1 Incomparable Items

Of the 15 "best", I did not encounter the five below in my work. Judgments as to isogloss status refer to my system.

p. 298: **ʔāb* 'take hold of, pick up' (T41: **hāb)*
A: *háw* 'bind, attach'
B: *háp* 'lift up'
D: *-əb-* 'carry
F: **ba* 'lift'
H: *ab-* 'conduct, escort'
I: *haɓ* 'carry water or liquid' Also in E1 Dongolawi.

I did not explicitly cover the fields of 'attach, lift, conduct' and this could easily account for my not finding this item in a very fuzzy semantic area (my S.S. 25). Note the tone difference between the two Ehret proto-forms. With some problems in phonology and semantics, this would perhaps be N-S **hab.*

p. 314: **yéd* 'to call (by name)'; **yed* 'name'
K: **yed* 'name'
C: *-er-* 'speak, say'
D: *k+ər+ɪo* 'name'
F: **yi* 'to (call by) name'
H: *k+ida*
I: *yér* 'say name'
Also in E1,E3 and in E9.

p. 333: **wàs* 'broaden, widen (i.v.)'
A: *wásà* 'be wide'
B: *wás+àm* 'yawning, to yawn'
D: *was+ryɛ* 'wide'
F: **wa* 'space, room'
H: *ossa+ko-* 'increase, augment'
I: *wàs* 'to tassel, of grain'

These two items would be *N-S in my sytem, with some problems with phonology in the first *(*yld ~ ylr)* and semantic spread in the second *(*was).*

p. 337: **wɛr* 'to increase'
A: *wárgá* 'be big, thick, fat, grow bigger'
B: *k+ùrà* 'big', *wur+a* 'become big'; *wár* 'recover from serious illness (sense of 'to rise')
K: Soo *wɛr* 'many'
D: *əwər* 'spread out'
F: **wu* ?
H: *ora-* 'exaggerate'
I: *wùrù+p+a+* 'thick of grass, tree' Also in E1,5 and E9.

I did not explicitly include 'increase, grow, etc.' Perhaps N-S **wVr* based on ABK in my system, but other semantics here approaches unacceptable.

p. 366 (and T46): **làal* 'abuse (verbally), shout at'
A: *láalí* 'curse'
B: *làn (<lal+n* ?) 'abuse, curse'
K: Ik *lel+ŧ-* 'be angry
F: **là* 'shout'
H: *lal-* 'denigrate'
I: *làl-gwò-šok'* 'persuade, incite to do s.t.' (lit.: *làl* -word or speech-repeatedly).

Acceptable as N-S ***lal* in my system.

Summary of above five items: all five problematic N-S isoglosses in my system.

5.3.2 Comparable Items

The remaining ten are as follows:

p. 14: **bè* 'to sit', **bètʰ* 'to sit, stay, wait'
A: *bètù* 'wait for, keep watch on s.o.' (error for *batu* ?)
K: Ik *ɛp* 'to sleep'
C: *bi* 'lie down'
F: Balese *ūpí* 'to sit'
I: *bè* 'to be (s.t.)'
J: **be* 'to sit'
Also in E2 Murle and E9 *Nilotic

The Songay item seems to be incorrect (Prost 1956: 298 gives *batu).* I found the fragment: A: *bat-, batu* 'wait'; I: O: *bat-* 'sleep'. Not convincing as an isogloss.

p. 192: **t̲ím, t̲úm* 'finish, complete'
A: *tímmè* 'be finished'
C: *dum* 'all'
D: *tíme* 'total'
F: **tu* 'all'
H: *tumma* 'all'
I: *t̲ím*
Also in E9a Shilluk t̲um.

p. 196 **(a)t̲'ee* 'stem, trunk'
K: Ik *ats'ᵃ* 'tree'
F: **t'i* 'tree trunk'
G: *ts'i+ts'i+a* 'tree'
H: *ǰa* 'stalk'
I: *àt̲'e* 'bamboo'; O: *c'e* 'tree'
Also in E4 *-ca, -ǰa* 'tree'.

In the first item above, I utilized S.S. 16: 'finish, death', not S.S. 1: quantity as in Ehret's examples. In fact, I have a Fragment 'all': C *dum, tum* ; H *tumm+a.* See my #355 ***tEm+* Arabic *tmm* and Cushitic *dlam.* My guess that the item is an Arabic loan is supported by Alan Kaye (p.c.). Either set seems plausible: Ehret's has a high vowel while mine has *i ~ e ~ a.* As given, the item would be *S-C.

The second is my #27 **dʒa* found in BKCFpGHIJ. The Ehret item suggests that there are two overlapping forms, one with *dʒ-*, the other with a palatal or fricative. But in no way is this item indicative of an underlying dental: it is S-C as it stands.

p. 229 (T37): **t'èl* 'lick'; *t'èlm* 'tongue'
A: *dèenè (<delme* ?)
B: *təlàm,* Kanembu *dələm,* Td: *term+eso*
C: Mb: *delmi+k*
F: **dra*
H: *tala-* 'taste, relish'; *tala* 'palate'
I: *t'ɛ̄ɗ* 'lick'
Also in E2,4

p. 309: **óo?* 'call'
B: Z,B: *a* 'name'
K: **'ɔɛ*
D: *ú-* 'say'
F: **ð'ú* 'be noisy'
G: *h+uuʔa* 'name'
H: *au-* Also in E1,2
I: *ó* 'say'
J: Se: *o'* 'sing'

My #357 ***TEl+N+* includes all of the above left except H Kunama and adjoins K Kuliak, D For, J Gumuz, and L Kado. But the item is areal: strikingly similar to several in Afrasian and others in Niger-Congo, it cannot be considered as *N-S.

The right-hand item is the only Ehret item with 8 families represented. It overlaps with my #65 **oi ~ ow*, though I do not have the gloss 'name' nor the F and G items, but do have items in L Kadu. It is *N-S as it stands above.

p. 310: **(a)yaˊ* 'mother' T44: **(a)yāa*
B: *yâ*, Daza: *aya*
C: A: *ya*
D: *ɾyə*
F: **ya*
H: **ya-*
J: Sai *yaaya*
Also in E1 and *En: E2,4,6,8.

p. 313: *ye, ya, yɔ 'go'
A: *yè* 'return', *yè+nà* 'go ahead'
B: K: *yá+t* 'carry away, conduct, bring to place'
C: *-ya-* 'enter, *-ye-* 'travel'
F: **ɔyɔ* 'go'
H: *yo-* 'arrive'
I: T: **yà* 'go', *yé* 'escape'
Also in E9 Nilotic.

Left: my item #279 **ya* has also K Kuliak, *E, and L Kadu forms. But this item is a "nursery term" also found in Proto-Bantu, Chadic, Cushitic, and Arabic. I also have a Fragment of form 'person, man': *ya-* in BDEI (could perhaps be considered as *Core). As it stands, it would be *S-C, if not symbolic.

The right-hand one is divided between my #177 II *ayo* and 184 II **+ja*, which combined have CFpHIJL. As it stands above, it could be N-S **yE*.

p. 314: **yen* 'meat'
B: Daza: *yini*
K: I: *in* 'animal'
D: *n+ino*
F: **ne* 'flesh'
G: *ni*
H: *ana* 'fleshy part of mammae of some animals'
I: T: *yìn* 'suet, fat', *à+yìn* 'oil'; Ko: *yɛn*, O: *jini* 'fat'
Also in E5 as *k+won, k+wún* [?]

Overlaps with my #75 **Si(N)+*. Ehret and I made different phonological choices and this leads to divergent glosses. As it stands above, would be N-S **(y)in*.

p. 382 (T46): **lúl*. 'dark, black'
B: K: *kəlùm* 'black (of night)', Daza: *k+ula* 'black'
C: Mb: *luluok/luluitu*
D: *lul* 'night'
F: **lu*
H: *lu+mmu-* 'grow dark', *k+ullu-* 'be dark', *umma* (<*ulma* ?) 'black, dark'
I: T: *úllá* 'black dog'
Also in E1,5 and *En: E2,4,8

Comment: part of this one is in my #146 *lUl ~ lum+* 'cold' and part in Fragment 'black, dark, night' C: *lu(liok), wulo(o)*; D: *lool, lul*; F: *lu-*. But I do not include

here my #303 **Vm(m)ai*. There is also a Fragment 'grass, green' C: *luho, -lida*; E *lawa, luum*; F: *luwɛ*. The semantic connection 'grass, green, wet, cold, dark, night' seems to be real, but I hesitate to equate 'green' and 'night'! As above, *S-C only.

p. 406: **se?* 'bite, tooth'
B: Z: *se-*, B: *sayi-* 'eat'
C: Mb *-is-* 'bite'
D: *ʌsí* 'bite'
F: **šé?* 'tooth'
G: *θɪ+ŋa* 'eat'
I: T: *še?* 'tooth'
J: S,Se,K: *sa, sɛ* 'eat'

Partially found in my #70 **si* 'burn, eat, bite' and #72 **Sa* 'eat, burn, food', but I did not connect them to 'tooth'. As above, *S-C *sI*.

In summary, the ten comparable fare less well than the five I missed: three are N-S in my system and four are S-C.

5.4 Ehret's Reconstructions as Isoglosses

5.4.1 Isogloss Survey

In addition to the 15 "best isoglosses" there are 36 reconstructed items in Ehret's list having five representative families (usually plus parts of East Sudanic) or having more than five but not being isoglosses. These are as follows, with represented families indicated (using my system):

p. 15 **bek^h* 'person' BKFIJ plus E8
p. 18 **bo* 'head' AKCHI
p. 38 **miɲi/muɲi* 'star, yellow' ABKCF plus E7 and *En: E2,8,9
p. 56 **ɗi?* 'burn' AKDFH
p. 57 **ɗol* 'sky, heavens' ABKFH plus E5 and E6
p. 61 **dee* or *ɖee* 'say' AKFHI
p. 69 **dwàr* 'attach, 'put together' BKFHI plus E4
p. 75 **ndɛ* (conjunction stem) ABKFH plus E9
p. 78 **ne, en* (near demonstrative) AKDFHI plus E1 and E4,9
p. 93 **ɗoŋk^{h}w* 'stay' AKBDI plus E2
p. 143 **ŋgwe* 'be' AKBFH
p. 171 **p^{h}ɛ̄* 'rise up' BKDHI plus E4
p. 196 **(a)ṭ'ee* 'stem, trunk' FKGHI
p. 206 **tāk^h* 'find (out)' BKCHI plus E9
p. 238 **tiŋk^h* 'enter, insert' BKDHI plus E4
p. 239 (T38) **tū* 'rise' ABKFI plus E4,9
p. 250 **t'ees* 'sand' BFHIJ plus E3 and E4,9
p. 256 **ka, ke, ki* (prepositions) ABKDHI plus *En: E2,4,8,9
p. 260 (T39)**kók^h* 'knock, tap, hit repeatedly' ABKHI plus E1,E9
p. 264 **àkó* 'breast' ACHIJ plus E1 and E9
p. 276 **k^{h}ose* 'belly' BKCHI plus E5 and E9

p. 282 **akʰi, akʰɪ* 'inside of mouth' AKDEH
p. 302 **ɲɪ?* 'produce (fruit, growth, offspring)' AKFHI
p. 327 **wá* 'leak, ooze' AKDFI plus E1 and E4,9
p. 330 **wàr* 'take' BDFHI plus E4
p. 333 **wãat* 'extract, pull off or out, detach' ABKFH plus E1,9
p. 338 **wɪ* 'kill, die' AKCDHI (see discussion in 4.3 below)
p. 343 **'wɛŋ* or *ʔɔŋ* 'eye' CDFHE
p. 345 (T43) **Wa* 'person' BDGHI plus E3,5 and E9
p. 351 **rãŋgw* 'glow' AKCHI plus E9
p. 351 **rée* 'drip, ooze, bleed', *(a)rée* 'blood' ABCFI plus E2,E9
p. 369 **leeɓ* 'be weak, infirm, feeble' ABKDH
p. 370 **lè, lɛ̀* ('in, at' postposition) ABDFHI plus E3,5
p. 374 **lɔ́* 'grasp' BKDFI plus E4,9
p. 394 (T41) **ser* 'put straight, in order' ABCHI plus E1
p. 406 **sɛ̃?* 'even, level, straight, true' BCFHI plus E4

Of the above, most do not qualify as potential isoglosses in Ehret's system because they do not have representatives in both major branches. The only N-S isoglosses among them are those on pp. 15, 61, 69, 78, 196, 239, 250, 302, 327, 330, 351 (second item), 370, 374, 406.

Thus, there are in the Ehret list 29 N-S isoglosses justified by his family-tree structure having representatives in five or more families (the 15 of 5.3 above and the 14 just listed). But of the first 15, only eight meet the isogloss requirements of my system. An inspection of the other 14 items reveals that all meet my criteria insofar as representation in branches is concerned except for possibly 250 (not accepting IJ as enough for Core isogloss status) so that 22 in all meet my representational criteria. This is not so say that I would accept all of them on examination of phonology and semantics. I have already questioned the one on p. 18 in 5.2 above and others are problematical, but I will not examine them in detail here.

Looking at the corpus (Ehret's list) as a whole, I did a sample of every tenth page (pp. 1, 11, 21, etc. through 421, but 360 in place of the 361 I missed in my numbering). The list items are arranged by initial segment (56 different ones) in a roughly articulatory order with a new segment beginning a new page, so that some final pages of a section have only one item each. I counted 131 items in all: an average of 131/43 or 3.05 per page.

The numbers for representative families per item are: zero: 2, one: 23, two: 52, three: 38, four: 12, five: 4. The particular pages of the sample did not include any with more than five families represented. East Sudanic isoglosses are rare in the list because they usually represent too few E.S. sub-families. Only the items of pp. 282, 343 qualify among the above. There are 18 putative Level-VIII (N-S) isoglosses and 12 of Level VII found among the 131 sample items, representing 22 items in all (some qualify at both levels).

Thus, only about 13.7% of the sample items (18/131) are Nilo- Saharan isoglosses, i.e. found in both of the top-level subgroups according to Ehret's classification. The total number of items is about 1281 (420 pages @ about 3.05 per page).[2] This means about 176 (or 13.7% of 1284) in the entire list if the sample is representative. The N-S isoglosses found in the sample generally are found in few families: five families: 2, four: 5, three: 9, two: 2 (average of foregoing: 61/18 or about 3.4). Of the items in 5.3 above, only the p. 61 and second of p. 151 items happened to occur in the sample.

5.4.2 Criticisms
5.4.2.1 Inadequate Supporting Data Sets

Compare these overall results. Of the Ehret reconstructions, there are approximately 176 N-S isoglosses in an average of 3.4 families each. Only 23 of the 176 occur in more than four families. My 173 proposed N-S isoglosses have an average family representation of 5.8. The total numbers are very close, but recall that I excluded many potential N-S isoglosses as being possibly symbolic, areal, or shared strongly by N-S and Afrasian or Niger-Congo (the exact number is 78). Many of these are included in Ehret's list and are counted among the estimated 176 Ehret isoglosses. Ehret also included grammatical morphemes, which I did not (these being treated in my 1989 article). Thus it is safe to say that I have considerably more and higher-quality proposed isoglosses than in Ehret's list.

Why are so many of Ehret's most likely isoglosses represented in so few families? First of all, the list is a list of "cognate sets" and does not seem to display attention to explicit criteria for isoglosses. For example, many items are found in only one or more rarely even zero families. Examples of these:

p. 1 **ɓãl* 'salt' I plus E4,E9
p. 6 **ɓɪl* 'break apart' I plus E1,9
p. 80 **nɛŋ* 'give' E3 and E4,9
p. 81 **nikʰ* 'tooth' E3 and E2,4

I do not consider the East Sudanic representation in any of these examples to be sufficient for isogloss status in either my or Ehret's structures, although the second and fourth ones can be expanded to *E status with further examples from other E.S. sub-families.

Second, it reflects the unrealistic structure of the Ehret N-S "family tree". At the very top, there are two major branches of which one is a small family (Komuz) and the other consists of a relatively cohesive family (Central Sudanic) plus "everything else". Thus, one can have an isogloss for N-S with representatives in only Komuz and Central Sudanic. Many such occur in the list, e.g. on pp. 1-5, there are three such:

**ɓad* or **ɓar* 'large' in FI plus E9
**ɓɪa?* 'inner shoulder' in F(I-J) plus *En: E2,8,9
**ɓɪ* 'much, many' in FI plus E8

I would count I and J as separate, so that the second item would have three families, but recall that the *average representation* of Ehret's items is only about 3.4.

The structure with one family posed against "everything else" is repeated at Level VII (Sudanic vs. the rest), Level VI (North Sudanic), Level V (B Saharan vs. the rest), and Level III (C Maba vs. the rest). This makes it easy to find lexical items shared by one "half" at these levels but difficult to determine anything for the "other half" because it depends on the complex structure below the node. It is presumably a result of finding "diagnostic" phonological features rather than looking at the complex bundles of cross-cutting isoglosses. (See Anttila 1989: Ch. 15 for a discussion of this matter with respect to Indo-European).

5.4.2.2 Reconstructions, Phonology, and Geolinguistics

The above would not be a legitimate criticism if Ehret's N-S structure is essentially correct, i.e. if it really reflects the facts about Nilo-Saharan. I think this is unlikely for several reasons.

The first of these is a characteristic of Ehret's method, seen in his other reconstructive work to date: the segmental system of the proto-language is taken to be very close to that of the present-day language having the most complicated consonantal inventory, in this case, Koman, in particular Twampa (Uduk). We have the astonishing result that one language (not a classical written language!) has remained almost unchanged while all others have deviated far from the proto-language. This is the old Semitic (or more saliently Afrasian) fallacy: "Proto-Afrasian or Proto-Semitic is very much like Arabic (usually Classical Arabic with all the consonants)".

The attractive feature of this "maximalist" alternative is that it makes it possible to account for nearly all correspondences as reductions (mergers) from a rich proto-system. But it flies in the face of common sense and experience in other language phyla in which splits are at least as common as mergers. I will return to this in 5.5 below.

Geolinguistically, Ehret's classification is also astonishing. Refer now to the linguistic map as well as the classification scheme. Let us start at the bottom and work up. Ehret's East Sudanic is questionable in my view because of the inclusion of Kuliak (about which, as already noted, Greenberg had doubts) and G Berta, which Ehret places with the Jebel Group. As has already been noted, Berta has had strong lexical influence on Jebel but grammatically is not close. In current work (Forth. e), I have found that Berta-Jebel is clearly anomalous: Berta vs. other East Sudanic shows a much lower level of lexical commonality.

Ehret's "East Sahelian" poses C Maba vs. "East Sudanic". In my work, I have found no such clearcut distinction between neighboring C Maba and D For as to place one coordinate to my Core Group with the other at a higher level. Truly astonishing, though, is placing faraway Songay as a coordinate with D For and "East Sahelian". At the next level up, then, we find B Saharan coordinate with what has gone before. Then comes Kunama, isolated off in the Eritrean hills (geographically alongside only E3 Nera).

The migratory or diffusional explanations of this weird geolinguistic structure

will require very strong supporting evidence. In my scheme, Songay and Saharan are both peripheral linguistically as they are geographically (along with Kuliak, which is tucked away in a corner of Uganda).

The top two levels are also hard to accept. F Central Sudanic is surely closer to the lower families than are Songay or Saharan, both of which have always been recognized as problematical within N-S. In fact, Greenberg had Central Sudanic in his "Chari-Nile" alongside East Sudanic, Berta, and Kunama.

Placing I-J "Komuz" as the most deviant family in N-S makes sense only if one accepts the "maximalist" phonological method. Geolinguistically, "Komuz" is presently located near the N-S center and neighboring to G and parts of E and F. Lexically, bonds to E and L (Kadu- not considered by Ehret) are strong. I have not seen any refutations of my grammatical isomorphs, especially those centering on the fundamental categories of number and gender (Bender 1989b, 1991a). It is hard to see how these could be reconciled with the removal of I-J from my "Core Group" (EIJL) and with Ehret's placing of families A and B.

5.4.2.3 Sources

Another problem is imbalance of utilization of sources. Of course there is an inevitable dimension to this in the uneven documentation in the literature. Because of the many languages and much data available, East Sudanic, especially E1 Nubian and E9 Nilotic, are much over-represented in both Greenberg's and Ehret's work. Look over the examples in 5.2 and 5.3 above for the sprinkling of E1 and especially E9. This problem of uneven representation also applies to the overuse of several other languages such as A Songay, B Kanuri, E4 Gaam, for which relatively abundant data is available.

In the 51-page pre-publication paper "The Phonological Reconstruction of Proto-Nilo-Saharan" (p.4) accompanying the reconstruction list, Ehret explains his policy towards sources. He uses a single reliable source for each language (with occasional use of supplementary sources) in order to avoid inconsistencies. Sources are rated as "first-level reliability" which "...mark[ed] both segmental and prosodic features on either the phonetic or phonological level.", second-level "...which appear accurately to represent segmentary phonology or phonetics,.." and third-level "... which were reliable on consonant representations and usually consistent if inadequate on vowel marking."

This is a reasonable policy, but it does have the drawback of unduly limiting the data base. Using my families as guide, Ehret's list on p. 4 includes the following: A: one: Kaado; B: Kanuri: one plus a supplemental one; K: one; D; one; F: Moru-Madi, Mangbetu, Logbara and all others; H: one; E1: Dongolawi; E3: one; E4: Gaam; E8: Daju; E9a: Colo (Shilluk), Jieng (Dinka), and Naath (Nuer); E9b: Masai and Teso; I: Twampa (Uduk). Sources for C Maba, G Berta, J Gumuz are not given. It is clear from the lists that other sources were used and I am sure many new sources which appeared in the past decade will have been consulted for revision of the work.

Evaluating Ehret's proposed isoglosses forces the realization that most of his forms are not isoglosses at all, as has already been seen. But consider a few more examples from those explicitly given as "N-S cognate sets". Opening the pages of the text at random, I found these on p. 39. I use Ehret's groupings here where they differ from mine with abbreviations: N for "North Sudanic" and E for "East Sudanic". I now order the families from top to bottom according to Ehret's scheme.

**kɔ̄kʰ* 'tap' INBAEK
N is represented by a single item from E1 Dongolawi and E by a single item from Shilluk plus the Kuliak one.

**kʰɔ̄ɔm* 'heap, hump, lump, mound, curved surface INHAE
N is represented by Dongolawi and E by E4 Gaam and E9 Luo.

**khɔ́t* 'tear off, pull up or off' INBAE
N is represented by Dongolawi and E by Shilluk.

**k'éel* 'horn' JNHAE
N is represented by E3 Nera and E by E2 "SW Surma" and E4 Gaam.

To me, both the use of single languages to characterize large groups and the failure to check for adequate representation invalidates all these as possible N-S isoglosses. In fact, there are glaring inconsistencies in these examples. N (No.Sud) includes everything except IJF. How, then, can Dongolawi or Nera (single languages, both belonging to the Astaboran branch of E) be taken as representative of N? In each case, only one or two of E2 SW Surma, E4 Gaam, E9 Shilluk and Luo, and K Kuliak are taken as representing E (E. Sud.). What this means is that neither N nor E is adequately represented herein and that without either F or N, none of these is an isogloss for N-S. In fact, none of these items is an isogloss for anything above possibly (weakly) E for the first and last one and Kir-Abbaian for the second one.[3]

The last example corresponds to my #142 *kʰil+* for which I have ABDHE. In my scheme, the involvement of Level III Outliers A Songay and B Saharan plus nearly enough to bring in Satellite-Core justifies the isogloss as a weak one. In fact, if I included J Sese -my data show *k'əla*, not *k'ɛla* as in Ehret's example- the case for Core and Satellite-Core would both be made, but the vowel *ə* does not fit the pattern while *ɛ* does.

5.4.3 Ehret's Semantic Arguments

In the 1983 and especially the 1989 articles, Ehret augments the usual phonological argumentation by seeking semantic bases for sub-classification. Consider the following example (1989: 40-1 and also T43) used to justify the "Sahelian" group (A Songay, D For, and "East Sahelian"):

**wi* 'kill', found in:
A: *wɪ́*
C: Mb *-w-*
D: *-ʊ-*
K: I: *iw* 'hit with stick'
E7: T: *wi* (?) 'shoot'

**wi* 'die', found in:
I: T: *wú* 'die'
F: **wi*
H: *wi* 'be quiet, disappear'

The F item occurs only in the 1989 article. Ehret does not give the form of the E7 item. In his argument he also gives other (complementary) roots in the semantic domain. The point is that the split between the glosses 'kill' and 'die' supports the "Sahelian" group vs. the rest. My data contain a Fragment (could be upgraded to a weak isogloss in Satellite-Core):

'die': C: Mb *ɔy*, Ms. *iy*, A*uy*; D For *wɔi, wayo*, I: O*wee, wɛi*, K*owii, wu, wo?*;
'kill': C: Kobe*weya*, Ms *iyaw, iwi*; Fc **hwi*, H: Kunama *iya-fa-* (lit. 'hit-throw').

The additional data for C, Fc, H show that the situation is not so simple in two ways: i) *w* and *y* are both involved, ii) C, D, and F all provide partial counter-examples to Ehret's distribution.

A second example is that of pp. 44-5, said to support the "North Sudanic" group: H plus "Saharo-Sahelian", i.e. this Level VI group vs. I-J and F.

**wiṭ'* 'mouth' found in D, H, "Kir-Abbaian"

**t'wah* found in I, F

I did not find these in the ms., but did find **ooṭ'wo?* on p. 201, found in DHEnI, presumably representing an earlier treatment in which the two roots were combined and did not have the distribution stated in the 1989 article. The items are found in my work as a Satellite-Core item #328 **(n)dO* , found in DFcGHEn and as a Fragment B: *ṭe*, I: *t'(w)a*. My treatment cuts across Ehret's: Fc is in one form and I in the other. Furthermore, **do* is found in Niger-Congo and **da* 'tongue' in *Mande, so that the status of this item as *N-S is not clear.

A third example, **ɗa* 'foot, leg' (1989: 43 and list p. 85 as **ɗa)*, is used to help justify "Saharo-Sahelian" B plus A,D "East Sahelian"). The root is said to be found elsewhere (FJ) as **ɗa* 'go'. As 'foot, leg' it is:

B: Kanembu *ɗo*, Z: *dai*
C: Mb: *jak*, 'footprint' *ja*; Mm: *dya* 'thigh'
E9: Shilluk (Colo): *da+to* 'hoof' (1989: 43 says this is Nuer; Heasty 1937: 65 gives Colo 'hoof' *dado* or *dato*; I did not find it in my Nuer sources).

The distribution in B plus "East Sahelian" is weak without either A or D included. I have Fragment 'foot, leg' B: *dei, dai, dao*; K: *dɛ(a)*. The inclusion of the K item missed by Ehret would strengthen his case slightly, but in my system, B and K together indicate a possible ancient retention from *N-S.

To summarize, Ehret's "morpho-semantic" arguments based on roots with complementary distribution of variants works fairly well at the lowest levels ("East Sahelian" and "Eastern Sudanic", v. 1989: 39-40), since they really amount mostly to

low-level isoglosses) but do not stand up at higher levels. I believe this is because his overall N-S structure is wrong in the ways already indicated.

The method is subject to the risk of "finding what you want to find". Given the notorious fickleness of semantic change, we cannot expect *consistent* differentiation of meaning of the 'breast /chest' type in widely separated branches of a family. With Ehret's N-S structure having so many levels and so many "one against everything" nodes, it is to be expected that sets such as ABCDH or ABKC will share glosses. These could serve as evidence for "North Sudanic" and ""Saharo-Sahelian" respectively (although the first is much stronger than the second). In fact, either of these distributions would make sense in my system also: the first as an "excellent" isogloss found in two Outliers and three Satellites, the second in all three "outliers" plus one Satellite.

5.5 Ehret's Phonology

5.5.1 An Overstated Consonant System

We come now to the strongest part of Ehret's work: his attention to phonetic detail. Unfortunately, much of the detailed work is counter-productive because it rests on a fundamental error.

In the 1984 ms. text (p. 9), Ehret sets up a *N-S phonology having 40 consonants plus four labialized varieties *(mb*, etc.). This results from the assumption that *N-S had essentially the consonant system of present-day Twampa (Uduk) with six positions and five manners of articulation of stops. Even Twampa's near relatives (Komo, Opo, Kwama) do not have this plethora of consonants (Bender 1989: 260-6) and it is found nowhere else in N-S. The fallacy of the "maximalist" reconstruction of *N-S is easily seen with a glance at the table of the largest set of reconstructed word-initial stops and reflexes, the nine voiceless ones in dental, alveolar, and post-alveolar positions (T11). I have rearranged the column of representative languages according to my system.

Notes on table below: i) Ehret uses single languages for Songay (Kaado: Ducroz and Charles 1978), Saharan (Kanuri), Maba Family (Maba), E1 (Dongolawi), E4 (Gaam), E9 (E9a: "West Nilotic"), I (Twampa=Uduk). Notes continued below table.

	t̪	t̪ʰ	t̪'	‖t	tʰ	t'	‖t̪	t̪ʰ	t̪'
A	t	t	d	‖d	t	d	‖t	t	t
B	t		t	‖d	t	t	‖t	c	s
K	t		c'	‖t	t	c'	‖c	c	c'
C			d	‖d?		d	‖č	č	
D	t		t	‖	t	t	‖t		t

*F	t	t	t'	‖t	t	t'	‖t̪	c	t̪
H	t	t	t	‖t	t	t	‖t	š	t
E1	t		t	‖d	t	t	‖t	t	t
E4	t		t	‖t	t	t	‖c	c	t̪
E9	t	t̪	t̪	‖d	t	t	‖c	c	c
I	t̪ʰ	t̪ʰ	t'	‖t	tʰ	t'	‖c	cʰ	c'

ii) G Berta (part of Ehret's E4), J Gumuz (part of his "Koman") are not represented separately and L (Kadu) is not represented.

iii) I have omitted Ehret's notes regarding special changes, e.g. his note 9 to the reflex *t* of **t* in Kunama: *t* —> *š*/__*i*.

There are several striking features of this table:

(1) Although dentals are reconstructed for *N-S, dental reflexes occur today only in E9 (to which other East Sudanic languages could be adjoined: E5 Nyimang, E6 Temein, E7?) and I (Twampa only), to which L Kadu could be adjoined. *This is my Core Group, the innovative part of N-S.*

(2) The second group (alveolars) corresponds to my $*d_2$ phoneme in some cases; in others to *d*, *t*, or t_2. It seems likely that there are more than one *t*, *d* in *N-S, but Ehret's solution with dental position and apiration seems insufficiently motivated. Aspiration occurs only in Twampa, yet is reconstructed for *N-S!

(3) Reconstructed ejectives show ejective reflexes only in K, F, and I (Twampa). I was unable to reconstruct ejectives for *F or for *N-S, although reconstructed implosives do occur (Bender 1992). In fact, ejectives seem to be an "Ethiopian" areal feature (Berta and Komuz), plus Kuliak and sporadically elsewhere.

(4) It would make more sense to reconstruct the third group as voiceless alveolar or palatal affricates, given that there are such reflexes in BKCF and in Core Group members E4,9 and I. Only in *F (and in one E4 case) does Ehret's chart show post-alveolar with a subscripted dot as in his reconstructions. Ehret does not reconstruct palatals, but I have **j* and a hint of **c* (see 2.2.2 and 2.2.3.3 above).

5.5.2 Phonological Supporting Evidence

Similar remarks could be made about the five labials (*p*, p^h, *p'*, *b*, *ɓ*), five voiced coronal stops (*d*, *d̪*, *ɗ*, *ɗ*, *ɗ̪*), five velar stops (*k*, k^h, *k'*, *g*, *ɠ*), four fricatives (*θ*, *s*, *ʂ*, *z*), four glides (*w*, *'w*, *y*, *'y*), three sonorants (*r*, *l*, *l̪*), and four nasals (*m*, *n*, *ɲ*, *ŋ*), plus *ʔ* reconstructed by Ehret. But for economy, I will limit the examples to those supporting the nine voiceless coronal stops and will mainly look at examples for which I have corresponding isoglosses.

In the list, two additional consonants in the series are given: T and T̲: these were combined with the others in the text, which presumably postdates the list.

1. Examples supporting *t̲ (pp. 190-3; 12 examples)

p. 191: *t̲é* 'take hold of'
A: *tà* 'receive, accept'
B: *tá* 'hold fast, catch, seize'
I: *t̲é-mèd* 'shake-hands'

p. 191: **t̲iikʰ* 'thin strand, fiber'
B: *tík+tígà* 'feather'
H: *šika* 'reed, rush'
I: T: *t̲ikʰ* 'reed for arrowshaft'
J: *tɪxa, t̲eha* 'root'
E9c: Kalenjin: **tiikii+t* 'root'

The left-hand item is part of my #333 **ta/ta+i,* found in ABCDFpHIJ. I have non-dental reflexes in 8 forms. It makes no sense to assume **t̲*. Furthermore, the item is found in Mande and Kordofanian and perhaps is even proto-NC (v. also overlapping #284).

The right-hand item is my #300 *tuk+* found in BKCHIJ. Both Ehret's Kunama (see his note 9 in my note iii to the table in 5.5.1) and Twampa items seem forced to make the case. Mine has Kunama 'feather' and Gule 'beard'. But this item may be areal, occurring in Mande, Chad, Bantu, and even Arabic (see Gule item).

p. 192: **t̲ím, *t̲úm* 'finish, complete'

My #355, already discussed in 5.3.2 above. Only the E9a Colo (Shilluk), Twampa, and Kadu examples have *t̲*.

These are quite typical of the 12 examples: all have Core Group E9 and/or I Koman items with *t̲* and no others (except one from Gumuz, also Core): totally unconvincing evidence for setting up **t̲*..

1a. The list also includes **T̲* (pp. 202-5, 9 examples). Typical is:

p. 202: **t̲ée* or **t̲'ée* 'cow'
C: *dek/de*
F: **ti*
G: *tu(ŋ)*
Ek: E1: **tii* or **tee;* E7: Tm *tɛ́ɛ́* or *tɛ̀ɛ̀*
*En: E2: **taŋ;* E4: *tɔ́ɔ/tɔ́g;* E6: *nt̲eŋ/kit̲uk;* E8: **tenye/ tukke;*
*E9:**t̲iaŋ/t̲iuk.*

Ehret's item is restricted to S-C. It may be that two roots are involved. My #167 *t2ei* in BCDEIL excludes forms with vowel *-ɔ-, -u-*. Semantic transfer to other domesticated animals ('goat, sheep') is not problematical for the area. There is no evidence here for *t̲* as proto-N-S (found in only En in this data set).

2. Examples supporting *t̲ʰ* (pp. 194-5; 6 examples)

None of these appears among my isoglosses. All include few languages and none is convincing or interesting.

3. *t̲'* (pp. 196-201; 19 examples)

p. 197: **t̲'ēk* 'heavy, difficult'
B: *tɔ̀g+ər* 'be difficult'
H: *tag+ima*
I: *t̲'ikʰ-* 'fat'
E9a: **t̲iɛk*

p. 199: **t̲'ini* 'small'
B: Td, Daza *tini* 'thin'
Also found in E2, E3, E9
(latter as Luo **t̲in)*

Left: The Twampa item seems to be forced. My #193 II *tOg* in BCFpHI.

Right: This is my #334 *tan + ~ ten* in ABCEIL and also in Mande and IIb of N-C, possibly areal or symbolic. In any case, a dental non-ejective reflex in one Nilotic language is not grounds for **t̲'*.

p. 199: **t̲'ɪ̄tʰ* or **t̲'ɪ̄t* 'tight, constricted'
H: *tit+imi-* 'narrow, constricted'
I: T: *t̲'it̲ʰ* 'too small to fit, exceed size of hole'

My 80 **tIt(t)+* in BKCDHEIJL. My data show Twampa *t'-* ~ *t̲'-*.

p. 201: **oot̲'wo?* 'mouth'
D, H, I as in my #328 and Fragment (see 5.4.3 above).
E2,4,6,9 as in my *En *(ku)tu(k)* with E6 and E9 having *t̲*.

The same overall evaluation applies as for 1. above. Among the 19 examples, only 'tree' (see in 5.3.2) and another example have K with *ts'* (in the table, it appears as *c'*). There is no no case for reconstructing dentals or ejectives.

4. **t* (pp. 206-212; 21 examples)

p. 208: **tek* 'one'
C: *tek,* Mm *deg*
I: *tēkēl+* 'only a few, one there and here'

My #261 **de(+g)* 'a single unit' found in BKCDFpGEIL. The Koman reflexes I found here have *d-* and *ɗ-*. The Twampa and Maba items with *t-* are much in the minority. In fact, this item is part of a "global etymology" with forms *tok, tik, dek,* etc. found widely in N-C and also in Chadic. See also my #199 II *tUk* under 5. below.

p. 208: **teer* 'pick up'
K: Ik *tir* 'hold in hand'
F: **tri* 'take off'
I: *tēr* 'collect, gather'
E2: Larim *tel+a* 'bring',
E9a Nuer *der*

p. 208: **tiiB* or **tiip* 'step, tread'
A: *ɗíbɪ́* 'tread'
B: *ɗvöl* 'way, street'
H: *tibi-* 'go barefoot'

Left: my #83 **t$_2$ir* in BKCDEkI. I did not find the *F item.

Right: this is Ehret's only example having both A and B *d-*; it would correspond to my *d$_2$*, but I do not have this item.

4a. Ehret's list also has **T* (pp. 231-5, 15 examples)

p. 231: **Tau* 'belly'
A: *tù* 'placenta'
D: *ditɔ/kitɔŋa*
(Jakobi 1990: *d-iɔ/kidɔŋa)*
F: **tɔ* 'stomach'
I: Komo, Kwama *tat*
Ek: E1 **tuu;* E3 *tawa*
E9b: **-tau* 'heart'; E9c: Nandi *ke+to+e* 'abdomen'

p. 233: **TiL* 'louse'
C: *til*
F: Mangbetu *ne+ti*
H: *tila*
E7: *til* 'flea'

Left: my #24 **d+u* in BKDGEIL approaches this item differently and includes a different Koman form. Neither Ehret's D nor I item belongs here in any case.

Right: all reflexes have *t-*, so why not **t-* ? Overlaps my #79 *tir$_2$+* in ABCGH.

p. 233: **Tip^h* 'hair'
B: *tə́pšì* 'pubic hair'
C: *tifi+k* 'hair, feather'
E3: *tefe+ne*
E4: *tifa* 'forelock'

p. 234: **Tóp'* 'pound, hit (thing) repeatedly)'
A: *tútúbú* 'crush'
K: Ik *tɔkɔɓ* 'cultivate, dig' *(< *tɔɓɔk)*
H: *tufe-* 'stamp (v.)'
E1: *tobbɛ* 'pat, tap'
E9c: Nandi *top* 'anvil'

Left: with these citations, why not simply **t* - ? My Fragment B *dfɪn;* C *tifi+k, teefa , tiifa* gives a better Saharan form from Karda.

Right: too imaginative. Better is my #247 I **tOb ~ dub* in KCIJL with central meaning 'dig' rather than 'hit'.

Ehret's p. 232 item **TeT* mentioned in 5.2 is also in this set.

Conclusion: most of the **T* items in Ehret's list are unproblematically **t*.

5. **t^h* (pp. 213-223, 29 examples)

p. 218: **t^{h}ɬ'* 'set afire'
H: *titti-* 'flame, make sound of flames'
I: *c^{h}ɬ'* 'kindle, light, set fire'
E9a Nuer *tiɛɬ* 'very hot', Dinka *tiɬ* 'crimson'

If this item is my #23 'burn, bite' **di ~ tet* in ABKC, then the case for **t^h* vanishes. I did not find the Kunama item in my sources. For I Twampa, Beam and Cridland: 1970: 44 give also *c^{h}it^h*.

p. 223: **t^{h}wok'* 'one'
D: *tɔk*
I: *t^{h}wā'ā'* 'first' Also E9a Dinka *tok*

My #199 II *tUk* with forms in KCDGL. All my forms have *t-, d-,* or *ɗ-;* there is no reason to set up **t^h-*.

6. **t'* (pp. 224-30, 20 examples)

p. 226: **t'ol* 'smoke (v.), give off smoke'
A: *dùllù* 'smoke'
H: *dullu-* ['give off smoke']
E1: *tull+a*
E9a: Dinka *tol,* etc.
E9b Teso *tol+a* 'smoke fish'.

p. 227: **t'ūɖ* 'pour'
B: *tə̀r+ɗt* 'bail out'
tə́+tə́r 'urinate standing'
H: *-tur-*
I: *t'ūɗ* 'fill with grain, water, etc.'

Left: my #87 **Tul+* in ABCDEI has *d ~ t* and leaves the exact nature of the initial stop open. Ehret's example does not support **t'-*.

Right: my #86 **TOr* in ABKH again has *d ~ t* and no support for *t'-*.

p. 229: **t'ɛl* 'lick', **t'ɛlm* 'tongue'

This is discussed in 5.3.2 above. The evidence of Twampa alone is not sufficient to set up **t'-;* my #357 leaves it open as ***TEl+N+*.

p. 230: **t'wɛɛm* 'finish, conclude'
B: *tämo* 'end, conclusion'
I: *t'wāmán* 'end' Also E9a Shilluk *tɛm* 'finish'

Ehret seems not to have noticed the possible connection of this with his root **ṯím, ṯúm* on p. 192 (see in 5.3.2 above). My #355 **tEm+* includes this item. Setting up **t'w-* on the basis of Twampa alone is not reasonable.

7. *ṯ* (pp. 236-41; 19 examples)

p. 236 **ṯam* 'to taste'; **ṯamṯam* '(good) taste'
B: *tám+tàm* 'flavor'
H: *tamu-; tan+tama;* 'savory, tasty'
*Ek: E1: *tan+čɛ;* E5: *tam* 'eat'; E7: Merarit *-tam-* 'eat'
E2: Majang: *ɗam* 'eat'; E9a: **cam* 'eat'; E9c: Kalenjin **camcam*

This overlaps my #356 **tEmb+* in ABKGIJL and my #275 **N+am* in AKCDEIL. The latter includes E forms with *C+am, C* being such as *k, g, l, ɲ, ɗ*. In other words, the root of 'eat' is *+am* and the 'taste' words are not necessarily re- lated. In

fact, both roots are suspect as N-S isoglosses: #275 is symbolic, found widely in N-C and Afrasian also while #356 is possibly an Arabic loan.

p. 237: **tepʰ* '(outer) shoulder'
A: *té+téfé* 'shoulder blade'
B: *tə̀lvú* 'armpit' *(<*təvul)*
D: *kətəb*
E4: Gaam: *cə̀f+á* 'upper arm'

p. 238: **tér* 'hop, skip'
B: *tə̀r+ə̀p* 'trot (of donkey)'
K: Soo *cér* 'run'
H: *tera-* 'play, hop, skip'
E9a Shilluk *cyɛr* 'stagger, totter'

Left: this item appears to be forced. Phonologically more natural is my #161 **tab+a* in BKDG (but the use of D For 'head' is somewhat disturbing). It might be advisable to replace my D form with Ehret's and also adjoin Ehret's A form.

Right: my problematical #28 **+dʔer+* in ABCFcHEI seems more natural.

p. 239: **tōŋkw* 'sit, stay, stop'
B: *tə̀ŋg+ăk* 'doze'
I: *cōkʰ* 'sit on haunches, toes'
J: Se: *icukʷ* 'stand'
*En: E2: **Tuŋ(g)-* 'sleep'; E8: **səŋd-* 'sleep'; *E9a: **cuŋ* 'stand'
E5: Nyimang: *tuŋ* 'lie down'

My #84 **tʔon-* in ABCGEnL overlaps with this (esp. En). and I have fragments 'sleep, etc.': B: *taŋgaN;* C: *tan(i),* G: *dĭŋɛ;* E: *Tɛŋ* and 'sit, stay, sleep': K: *zɛk'wa;* J: *jik-, zig-,* etc. What goes with what is not clear, but Ehret's analysis is implausible.

p. 240: **tum* 'drip, seep, leak'
K: Soo *tum+uθ* 'cloud'
I: T: *cúŋ+cúmtíd* 'seep out'
E2 C.Surma **tum* 'rain'
E8 Sila *sume* 'wet'

p. 241: **ṭwigw* 'foot/leg'
D: *tʊgí* 'hip'
H: *tuga* 'knee'
I: T: *àcūkʰ* 'hoof'
J: **cogw-*
E9a: Dinka-Nuer **cok,*
Luo **cogo* 'bone'

Left: too far-fetched to be taken seriously.

Right: unconvincing. Cf. my #354 **So(ŋ)k* in BKCDFpHEIJL, also found in Afrasian and Bantu. Cf. my A: *sɔ̀ŋ+kɔ̀l,* D: *sɔg+ɔl ,* H: *šok+oina ,* and I **šog* to the above choices. Ehret's D and H items and the reconstruction are doubtful.

8. **ṭʰ* (pp. 242-7; 20 examples)

p. 242: **ṭʰa* 'milk'
B: *cā+m*
E3: *sa*
*E9a: **ca+k;* E9c: Kalenjin **cee ?*

My # 239 I ***Sa* in BHEIJL extends this, but it may be a loan (cf. Afrasian **Ca*

'cow', *C* a lateral fricative) and adds Kunama. No case for aspirated stop.

p. 244: **ṭʰi* 'give (forth)'
H: *ši-* 'generate, bring forth, cause, produce'
I: T: *cʰĩ*
J: Sai: *tya,* Se: *c'a*
*Ek: E1: Kadaru: *ti,* E5: Nyimang *ti* 'hold', E7: Merarit *-et-*
E9a: Dinka *ciet* 'convey'

My #284 **dʔi* in AKCDFEkIJL includes all this item except several palatalized forms (notably Kunama). This may be two areal roots, found also in Mn, N-C, and *Omotic.

p. 246: **ṭʰol* 'secrete or emit fluid'
B: *cɔ̀llɔ́* 'urine'
*En: E2: **cɔlɔ* 'excrement', E4: Gaam *culd* 'fluid afterbirth', E8 Shatt, Liguri *a+jalag+e* 'vomit'.

Adjoining the Mimi, Koman, and Kadu forms in my #236 I *sOOr* in BCIL make a strong case for initial palatal affricate, not an aspirated stop.

9. **ṭ'* (pp. 248-55; 20 examples)

p. 248: **ṭ'ée* 'ear', **ṭ'ém* 'leaf'
B: *sə́mɔ̀,* Daza *ši,* Td *šii/šima,* all 'ear'
I: **c'e* 'leaf'
J: all: *ts'ea* or similar
E3: *sem* 'grass'
E9c: Datoga *séendooda/séeŋga* 'leaf' *(< *ceeN)*

My Fragment: I: *ts'ee,* J: *ts'ea,* etc. The B and E3,9 items do not belong here.

p. 250: **ṭ'ees* 'sand'
B: *k+és+à, c+és+à*
F: Moru-Madi **tsé+ŋá*
H: *šišawa*
I: *à+c'éš* 'earth, ground, down'
J: sas+ima
E3: *sasse* 'dust'
E4: Gaam *sesa,* E9c: Datoga *i+sæsgwæænda (<*icɛɛc-)*

p. 251: **ṭɔɔl* 'intestines'
A: *téelí*
I: *c'ōlẽ*
E8: **ka+cal-*
E9a Nuer *cɔl* 'groin'

Left: my #105 *ce+ ~ šuš* in BCHEIJL.

Right: included in my #243 I **til ~ ciil+* in AEIJ.

p. 252: **t'ɔr* 'push'
A: *tə̀r+sə̀* 'push ahead with hand or foot'
D: *ʊtʊrɔ* 'bump into'

p. 253: **t'wád* 'rise, drift (of vapor), etc.
K: Ik *ts'udᵃ* 'smoke'

F: Lugbara *ɔ̄rɔ́* 'push up or back'
H: *dor+ko-*
E9a Shilluk *cɔr*
E9b Masai *-šɔrɔɔ́* 'brush against'

I: *c'wár* 'be blown off by the wind'
E3: *a+suro* 'smoke'

Left: overlaps with my #86 **TOr* in ABKH (see also 'pour' under 6. **t'-* above, which probably belongs to *d2-)*.

Right: artificial. More convincing is my #31 *#Dud+* 'smoke' in BKGHIL.

p. 254 **at',* 'bite'; **a'te?* 'incisor tooth'
K: **ac'* 'chew'
H: *tei+ma* 'canine tooth'
E1: *ačč-* 'bite'; E4: *ṭíá* 'canine tooth'

Ehret does not connect this to his item **se?* 'bite, tooth' on p. 406 (discussed in 5.3.2 above). It overlaps with my #72 **Sa* in BKFGHIJ (cf. Kuliak **K (?)ats'* 'eat').

Ehret includes in this series such symbolic items as p. 249 **ṭ̄s* 'sneeze' and p. 254 **t'uuṭ'* 'suck', both found widely in Afrasian and elsewhere. As with the other series displayed to support exotic consonants, these violate "Occam's Razor": they ignore obvious reconstructions with plain consonants in favor of forced ones for which there is often no basis whatsoever. E.g., see the item on p. 252 above: no reflex in five families has a retroflex consonant, but still *ṭ-* is set up.

5.6 Conclusions

Similar detailed study of Ehret's other consonant series and also of vowels is needed, but the foregoing suffices to make my points. The supporting series for the various coronal consonants are unconvincing because they do not include adequate coverage of families (e.g. only B Saharan and three languages in E East Sudanic for his **t'ini* 'small'), set up "exotic" proto-phonemes when the weight of the evidence favors "plain" ones (e.g. in the **t'ini* item, none of the attested reflexes has *t')* or are just far-fetched semantically and phonologically (e.g. **ṭum* 'drip, etc.'). Most items include all three types of weaknesses.

My criticisms cast much doubt Ehret's work but do not *refute* it altogether. After all, he may be right and I may be wrong, though it is most likely that we are both partly right and partly wrong. I think his work could be recast into a realistic family tree and would then lead to real progress in this difficult field. Ehret has identified many of the interesting areas in which future research is most needed, e.g. the exact nature of the stop series in the coronal area.

The strengths of Ehret's work are the size of his lexical base, his attention to phonetic detail, and his accuracy. Ehret uses the entire lexical stock of the available dictionaries for his best-documented languages (e.g. Kunama, Twampa=Uduk). His attention to phonetic detail is commendable, although I fear it is vitiated by preconceptions about the structure of the phylum. The errors in the corpus which I picked up are really few, given the vast size of the corpus.

The weaknesses have been pointed out and exemplified many times in the above sections; to summarize:

i) The "maximalist" approach in setting up the present-day most-expanded consonant system (Twampa) as that of the proto-language;

ii) Violation of "Occam's Razor": a fanciful consonant system is set up by positing a variety of highly marked consonants when the evidence indicates much simpler solutions

iii) disregard for the structure of the family tree in documenting correspondences;

iv) disregard for the geolinguistic implications of the family tree;

v) neglect of the roles of symbolism and areal and diffusional forces;

vi) use of single languages- especially the same ones over and over- to represent whole families;

vii) over-imaginative etymologies to force items to fit into an unnatural scheme when simpler alternatives are available.

6 Summary and Conclusions

6.1 Summary of the Lists

Let us begin with a summary of the five lists. Be sure to take into account the note immediately following the table.

List	Total	%	Level III	Level II	Level I
A: Isoglosses	258	71.7	173	26	59
	19**		16**	2**	1**
	89*		72*	6*	12*
B: Symbolic	21	5.8	19	1	1
	7**		6**	0**	1**
	8*		7*	1*	0*
C: Areal	25	6.9	20	4	1
	2**		1**	1**	0**
	11*		9*	1*	1*
D: N-S/N-C Links	30	8.3	18	6	6
	2**		2**	0**	0**
	8*		7*	1*	0*
E: N-S/Af Links	26	7.2	21	1	4
	4**		4**	0**	0**
	12*		12*	0*	0*
Totals:	360	100	251	38	71
	34**		29**	3**	2**
	128*		107*	9*	13*

Note: Recall that the Level III forms may have corresponding to them "sub-isoglosses" at Levels II and/or Level I. Level II isoglosses may have corresponding Level I sub-isoglosses. *These are not counted here.* This means that the tabulation is only of Level III, II, or I isoglosses: it does not count sub-isoglosses. (These are rarely clearcut, e.g. in List A.2, #30 has III *d_2o , II *to/tu* , I +*tu*. The I (Core) form has *t-*, the II (S-C) form has *to/tu* (reflecting the *tu* in Core), while the III (N-S) form has d_2, reflecting the *d-* in outliers vs. *t-* in S-C. Both the II and I forms could be considered sub-isoglosses in their respective families). The reasons for this are two-fold: i. more work is needed on the question of special phonological forms of these subsidiary items and ii. counting them would greatly complicate the presentation.

6.2 Conclusions

1. There are plenty of plausible N-S isoglosses: 258 out of 360 reconstructed items. List A was compiled with a view to regularity of phonological correspondences and plausibility of semantic content. The proposed isoglosses range from very strong (**) through strong (*) to unstarred less strong ones. Even the latter I judge to be of the level of quality usually found in published work of this sort: all involve a majority (half or more) of the families at the given level. Considerably fewer clear isoglosses for either Satellite-Core or Core sub-families are found. However, the numbers would be increased considerably if "sub-isoglosses" were taken into account (see Note above).

2. Symbolic forms are relatively few. The 21 "symbolic" forms of List B are among those found all over the Sahelian area of Africa. They have led to the positing of some rather uncritical claims of genetic relationship, "mixed languages", "substrata", etc. They should be put to one side as not comprising material for establishing genetic or areal classifications.

3. Areal forms are relatively few. Of the 25 which are identified herein, few are likely "Wanderwords" and most are somewhat mysterious as to their *raison d'eltre*. With further investigation, it may be possible to assign some to one of the three phyla: N-S, N-C, Afrasian.

4. Probable links between N-S and N-C (30 in number) are somewhat more frequent than the other categories not assigned to List A. The striking similarities in items found at the margins of the N-S and N-C territories provide support for N-C and N-S being members of one vast phylum.

5. Probable links between N-S and Afrasian (26 in number) are nearly as many as between N-S and N-C. These are surely partly owing to *linguae francae*, especially Arabic, but also local ones such as Amharic and Oromo in Ethiopia.

6. Of the four categories established by Greenberg (1957a), Lists A and possibly D are direct input into genetic classification, Lists C and E to diffusion, and List B to symbolism. The fourth category, chance, is operational in sporadic comparisons found in all the lists.

7. A detailed comparison with the classification of Christopehr Ehret is given in 5 above. Suffice it here to say that I consider my classfication to be more soundly based since it is grounded in morphology, represents all groups according to their place in the classification scheme, involves very conservative phonological reconstructions, includes explicit comparisons with other African phyla, and incorporates geolinguistic considerations.

6.3 Suggestions for Further Work

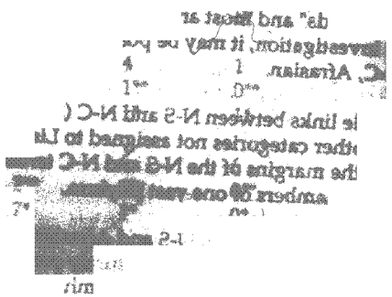
Briefly, if one accepts the foregoing modest work as a first step, the next steps in Nilo-Saharan reconstruction should be:

- expanding the lexical base to the level of the best dictionaries available, e.g. those of Armbruster 1965 for Nubian or Beam and Cridland 1956 for Uduk (Twampa); incorporating more of Ehret's material would be a first step in this direction;

-deepening the analysis of morphology with a view to isolating lexical roots and improving on our understanding of sub-groupings;

- updating literary and field sources: this is of course a never-ending task and can be done only to the moment of writing; in particular, making fuller use of the fieldworker network (especially missionary and Bible-translator sources) could help tremendously;

- studying phonological change in more detail, looking for innovations which determine sub-groups, while avoiding preconceptuons such of those of Ehret which are criticized in 5 above.



Chapter Notes:
Notes to 1st Chapter

1. (P. 16) Heine (1972: 8-9) also mentions the "Typological Method", which he points out is usually combined with The Resemblance Method. One of the main exemplars of this mixed strategy is Tucker (e.g. 1967a, b), although he refers to his work as purely typological. Alongside the three methods are three "models" or hypotheses of historical relationship. These are first of all "genealogical" (genetic) which goes along with both comparative and resemblance methods. The other two are discredited as *general* models of linguistic relationship: "Mischsprache" (unrelated languages A and C giving rise to a new language B related to both A and C), sub-stratum (unrelated A and C becoming related by exposure to a sub- stratum language B). Both models are important in appropriate contexts, but in general use are little more than "catch-alls" with low explanatory power. Both have been popular with European classifiers, e.g. "Nilo-Hamitic" as a Nilo-Saharan/Afrasian Misch- sprache (see the exchange between Greenberg 1957b on the negative side against Hohenberg 1956 and Huntingford 1956 on the other). Homburger (e.g. see her 1941, 1957) might be seen as a supreme ex- emplar of substratum, with Egyptian serving as a general substratum of all African languages.

2. (p. 20) The environmental crisis, which includes a frightening pace of extinction of plant and animal species, is paralleled by the loss of "language species", e.g. consider Beygo of the Daju Family and Gule of the Koman Family, both of which can now be marked with † indicating extinction. But how many others are faced with decline and possible extinction in the next few decades? In eastern Africa, Arabic is rapidly displacing local African languages, especially in Sahelian Africa, while Amharic and Oromo are doing the same on a smaller scale in Ethiopia. See Sommer 1989. In my current work, I have noticed, but have not tried to record systematically, the influx of Arabic into dozens of languages, ranging from a few items in cultural and technological lexicon to a flood reaching even into the domain of prepositions and conjunctions.

Is this bad? The ecologists agree that it is not only bad but a potential disaster- perhaps a final disaster- for biology. We are now realizing that the linguistic deterioration is also very bad for us- not just for professional linguisticians, but for all of us. It means that much of the vibrant localism of human culture is disappearing at the same time that the raw material of linguistic research is being eroded and destroyed.

A last-ditch effort is underway to do something about it. See the first issue of *Language* in 1992 (Vol. 68 No. 1) for a very stimulating set of articles (herein referred to as Hale et al. 1992) on the topic. Hale warns that the numbers are worse for languages than for (e.g.) mammals: as against maybe 10% of mammal species being in danger, 90% of languages may be. He ends with the warning (ibid. 10): "Obviously we must do some serious rethinking of our priorities, lest linguistics go down in history as the only science that presided obliviously over the disappearence of 90% of the very field to which it is dedicated". Ladefoged 1992 presents a dissenting view.

3. (p. 30). But Tucker (1994: 12) says that Adola could be considered a dialect of Luo, while Alur is much closer to Luo than Acoli/Lango is.

4. (P. 37) Much recent work sheds important light on the questions of word-order universals. Dryer 1992 may well be a definitive explanatory paper. Dryer argues that maintaining consistent branching direction in syntactic derivations is the explanatory basis of word-order universals.

5. (p. 38) Orin Gensler (1994ms.) suggests the importance of adding to the usual SOV etc. the order S-Aux-OV in diachronic syntax, in particular that SAOV was the order of *N-C.

6. (P. 41) I will not go here into the intricate field of genetics, especially the study of mitochrondial DNA and its implications for tracing the human family tree. I will instead refer to only two recent summaries of the current controversy regarding human (Homo sapiens) origins. The first is a pair of opposing articles in a recent issue of *Scientific American*, one by Thorne and Wolpoff (1992), arguing for several independent origins of Homo sapiens, the other by Wilson and Cann (1992), taking the opposed view of an African origin and later spread throughout the world. The other summary is that of Klein 1992, which argues that the single-origin scenario is more plausible than that of multiple origins, although more recent redatings of some classic fossils casts doubt on the African genesis theory. If languages of the modern type originated in Africa before the dis- persal, then monogenesis of language also seems to be plausible, so that the attempts to show relatedness of all world languages may yet meet with success. But we are far from that goal and what is needed is more work on known phyla such as Nilo-Sa- haran, careful attempts at interphylum comparisons, and refinement of the histor- ical/comparative method in order to achieve the greatest possible time-depths.

7. (p. 42) More recently, a restudy of Diakonoff 1988 (Bender Forth. g) leads me to suggest a quite different sequence of events, namely:

i. Afrasian origin in an area of what is now Republic of Sudan;

ii. Egyptian, Chadic, and Omotic are three independent branches of Afrasian, sharing archaic features; each arrived in modern locations after early migrations;

iii. Berber, Semitic, and Cushitic form n Afrasian branch (BSC) characterized by prefix conjugation (among other innovations); BSC moved northward along Nile;

iv. Indo-European may be another member of the BSC branch which moved on into Asia; this would account for the oft-noted similarities in phonology, lexicon, and morphology between IE and (the BSC branchof Afrasian); the timing is congruent (beginning of Afrasian breakup about 12-10,000 B.P. and IE about 8-6000 B.P.

8. (P. 45) In another study Fleming 1979 concludes on the basis of the blood-grouping data of Mourant 1976 that there is a valid "Ethiopoid" local race which is either Caucasized Africans or Africanized Caucasians. Fleming himself suggested his results are problematic because of the limitation to blood groupings (ibid. 27) and it is superseded by more recent work such as that of Cavalli-Sforza et al. 1988.

9. (P.45) It is interesting to note that the tallest of all "elongated" peoples and in fact

of all world populations is that of Naadh (Nuer). Hiernaux 1974: 147 gives their average stature as 185 cm.(6' 1"). Incidentally I should have taken measurements while among Surmic peoples in southwest Ethiopia: I can state that in one Suri settlement (American Presbyterian Mission station) even the juveniles (males and females) usually were well over my height of about 180 cm. (5' 11").

Notes to 2nd Chapter

1. (p. 64) The genetic classification given here is based on the least controversial method of shared morphological innovations. But contrary to the views of some extremists, I hold that phonological and lexical isoglosses should also be pursued as evidence and that except in unusual cases, one should expect them to parallel the morphological classification to a large extent. In fact, this volume is a summary of such an investigation.

2. (p. 65) See also Note 7 to Ch. 1.

3. (p. 73) It would be desirable to identify the exact sources of each item appearing in Lists A-E, but this would expand the lists to an inordinate length. Individual languages are identified and the reader can track down the sources in References.

4. (p. 74) There are 102 reconstructions which are not isoglosses compared to 258 surviving isoglosses. Proposed isoglosses thus account for 71.7 % of the reconstructions, so that only about two-sevenths of reconstructed items have been discounted as possible isoglosses. Of the 133 Level II forms, the 26 of List A.4 are not included among those with Level III forms. Of these, there are 2 **, 6 *, 18 no star. Of the 175 Level I forms, the 59 of List A.5 are not included among those with Level III or Level II forms. Of these, there are 1 **, 12 *, 46 no star.

5. (p. 74). Another dimension worth considering is that of how many of the 12 families are represented for each proposed reconstructed form:

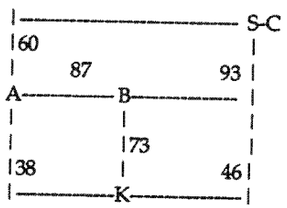
No. Fams.	A.1 Exc.	A.2 Good	A.3 Fair	Tl. III	II	I	All Isos.
11	0	1	0	1	0	0	1
10	5	1	0	6	0	0	6
9	1	2	0	3	0	0	3
8	7	13	1	20	0	0	20
7	3	20	3	27	2	0	29
6	0	22	20	42	6	1	49
5	0	4	36	40	8	3	51
4	0	6	18	24	9	21	54
3	0	3	7	10	1	25	36
2	0	0	0	0	0	9	9
Tl.:	16	72	85	173	26	59	258

Ave.:	136/16	468/72	425/85	1025/173	129/26	198/5	1352/258
	=8.5	=6.5	=5.0	=5.9	=5.0	=3.4	=5.2

Among the isoglosses, the average representation is highest (8.5) for Level III "Excellent" (List A) and drops off monotonically through "Good", "Fair", Level II, to 3.4 at Level I. For the 173 Level-III (N-S) isoglosses, the average is 5.9.

Note that the numbers of families represented at Level III (Col. 5: Total III) present a fair approximation to a normal distribution. In a forthcoming paper (Ringe ms.) has shown that the distribution of families represented in the Illich-Svitych "Nostratic" reconstructions form a binomial distribution with peak at the low end of the scale, i.e. with only two families represented, whereas those represented in the Pokorny IE reconstruction do not. This strongly suggests that the Illich-Svitych result is random while the Pokorny one is not. But the reasoning does not apply here because (a) the peak of my distribution is in the "middle" (between 5 and 6) rather than at the low end (2) and (b) the number of families represented in my work does not bear a direct relationship to the sub-grouping. For example, Family I may enter as part of a Core isogloss only, as part of a Core isoglosss which contributes to an S-C isogloss, as part of an S-C isogloss which is part of an N-S isogloss, or none of these (it may be just an isolated item alongside an S-C or N-S isogloss). Given the complexity of the situation, I think that a binomial distribution peaking in the middle is to be expected for the distribution of individual family representation.

Ringe's argument should be applied to my four highest-level N-S families: A, B, K, and S-C, but four families is too small to allow significant results. Nevertheless, I did a study of the distribution of these four. The representation in the 173 Level-III isoglosses by families A, B, K, and S-C is as crudely diagrammed below:



The diagram is roughly geographical and linguistic. The numbers are of isoglosses shared by pairs of families out of the 173 Level-III isoglosses of List A. Thus, from West to East, A (Songay) shares 87 with B (Saharan) and B shares 93 with S-C (Satellite-Core), while A shares only 60 with S-C. K (Kuliak) shares only 38 with A, 46 with S-C, and 73 with B. Thus, K is relatively isolated except that B and K seem to share a special relationship (e.g. in grammar, only B and K have 2 sg. pronoun *b*, see Bender 1991: 11). B is closest to S-C both linguistically and geographically. A shares much with B but little with more distant S-C.

Also interesting is the distribution of three-way and four-way sets of agreement. There are 16 cases in which ABKS (now using S for Satellite-Core) all co-

occur among the 173 isoglosses (of course these are just the "Excellent" Isoglosses of List A.1). There are 72 cases of three co-occurring ("Good isoglosses": List A.2) and 85 cases of two at a time ("Fair isoglosses": List A.3). Of the three-ways, it is interesting that only one case of AKS occurs (Item #55) and of the two-ways, there are only four of AK (#128, 133, 136, 166). KS is also rare at six cases (#120, 126, 138, 140, 145, 172).

The distributions are far from random and the structure of my Nilo-Saharan is not like that of Illich-Svitych's "Nostratic".

No. of Fams.	B: Symb.	C: Areal	D: N-S/N-C	E: N-S/Af	Tl. B-E	Tl. A-E
12	2	0	0	0	2	2
11	0	0	0	0	0	1
10	3	1	0	1	5	11
9	2	0	0	6	8	11
8	4	1	4	2	11	32
7	3	4	5	4	16	44
6	4	7	6	4	21	70
5	3	9	5	3	20	71
4	0	2	4	4	10	64
3	0	1	3	1	5	41
2	0	0	3	1	4	13
Tl.:	21	25	30	26	102	360
Ave.:	164/21 =7.8	144/25 =5.8	159/30 =5.3	168/26 =6.5	625/102 =6.2	1988/360 =5.5

The symbolic and diffusional items show an overall average higher than that of the isoglosses (6.2 vs. 5.2) -this is not surprising since *S-C and *Core have by definition restricted distributions. In fact, symbolic and diffusional even slightly surpass Level-III (*N-S) by 6.2 to 5.9. "Symbolic" items show an average of 7.8, next highest to Level III "Excellents" (8.5). This is not surprising, since by their nature, they should be widely distributed (it would not be surprising if they scored higher than "Excellents"). "Good" isoglosses and N-S links to Af are third highest (each 6.5). The ex- planation for the high score of N-S vs. Af is extensive contact, more so than with N-C, which is geographically far from all N-S families except A, B, K, and parts of E and F. The influence of Arabic, perhaps also of Berber, Hausa, and Amharic also probably play a role.

6. (p. 74) What is the distribution of family-by-family representation? A brief table follows. Note that the size of family and richness of documentation has a large impact on these numbers so that it is difficult to judge over- or under-representation. Families F and E have been divided here into Fp and Fc and Ek and En respectively so that there are 14 "families".

Family	Exc.	Good	Fair	III Tl.	S-C	Core	II+I	Tl.
A	16	49	41	106	0	6	6	112
B	16	71	63	150	3	14	17	167
K	16	42	28	86	0	12	12	98
C	14	44	36	94	17	13	30	124
D	10	35	36	81	13	7	20	101
Fp	6	31	35	72	19	4	23	95
Fc	6	32	30	68	15	4	19	87
G	7	25	19	51	11	6	17	68
H	10	34	36	80	11	6	17	97
Ek	8	24	25	57	9	27	36	93
En	10	25	24	59	8	33	41	100
I	10	47	40	97	14	48	62	159
J	8	19	18	45	8	11	19	64
L	11	39	35	85	17	36	53	138
Total	148	517	466	1131	145	227	372	1503
Ave. of A-L:	10.6	36.9	33.3	80.8	10.4	16.2	26.6	107.4

B Saharan and I Koman have the highest total scores: both have lots of data to choose from. Next highest are L Kadu and C Maba, both having good data bases. G and J are lowest: both are single languages. Recall that E and F are both based on reconstructions, not sets of individual-language items. Taking the range of documentation into account, it seems that all groups make reasonably equal contributions to isoglosses.

Consider N-S isoglosses. En is the innovative part of E.S. compared to Ek and En has a larger data base. E9 Nilotic alone has as many languages as the rest of East Sudanic put together (even though Nilotic is "boiled down" by use of proto-forms). In addition to Nilotic, E2 Surmic is large, whereas Ek has no comparably large family (Nubian is the largest, but E3, E5, and E7 are all small). Nevertheless, En and Ek score significantly the same: En 58, Ek 56. This means that the 173 isoglosses may be weighted in favor of shared retentions. See my East Sudanic paper (Forth. h).

Fp and Fc are harder to evaluate: Fc is large, but a relatively homogeneous group, while Fp is diverse (not necessarily a genetic unit). The difference between their scores (Fp 72, Fc 68) is probably not statistically significant.

Columns five and six give figures for Level II (Satellite-Core) and Level I (Core) isoglosses. It is to be expected that Families A, B, K will score low for both of these levels and that E, I, J, L will score highest for Core. The second observation is supported, except that J Gumuz is far lower than the other three and in fact, lower thaan three non-Core scores (B, K, C). Outliers B and K score strongly with Core (higher than any Satellite except C), while A, B, K are zero or three in the S-C column. Does this indicate contact between B and K (but not distant A) with the Core Group? This should be investigated further.

The Satellites (C-H) score twice as high (ave. 14+) than Core (ave. 7-) in the S-C column. In the Core column, Satellites except for C Maba score poorly. This suggests that Satellites may form a genetic family after all. I Koman and L Kado show the highest scores in the Core column (reflecting a suspected special relationship between these two ?). Gumuz is very low, showing again that the assumption of a special "Komuz" (Koman + Gumuz) relationship is questionable. East Sudanic is a bit lower (recall again that reconstructions are used here and this lowers the scores).

The results for the non-isoglosses are:

Family	B: Symb.	C: Areal	D: N-S/N-C	E: N-S/Af
A	14	11	13	20
B	18	15	17	21
K	12	16	7	12
C	15	19	20	18
D	12	10	10	9
Fp	7	9	13	12
Fc	7	9	13	11
G	15	3	9	12
H	11	10	9	7
Ek	14	13	15	11
En	14	15	19	13
I	19	16	19	20
J	11	7	7	11
L	16	13	15	13
Total	185	165	186	190
Ave. of A-L (treating Fp, Fc, Ek, and En as families):	13.2	11.8	13.3	13.6

The average representations of these non-isoglosses are remarkably consistent: from 11.8 to 13.6. Among Symbolic forms, family F is low (effect of using reconstructions?, but E scores twice as much). B and I are highest (lots of documentation). Among Areal forms, G and J are low (single languages) and C is highest. Among

N-S to N-C links, single languages D, G, H, J score lower, as expected, but K Kuliak is also low, indicating remoteness from N-C contact. Among N-S links to Afrasian, scores average nearly the same as those of N-S to N-C. Families A,B,C, and I score highest and D and H. There is no consistent correlation with probable contacts with Afrasian languages. Kunama is anomalous here, since Kunama today is surrounded by Afrasian and it seems that there has been Afrasian influence in Kunama grammar (see Bender and Alexander Forth.).

6. (p. 74) What about individual language representation? A quick count of individual languages appearing in Items 1-16 (Excellent Isoglosses) shows these results:

A: Gao: 14; Kaado: 7; Zerma: 7
B: Kanuri: 8; Tubu: 7; Teda: 6; Zagawa: 3; Berti: 1
K: *K: 6; Nyangi: 4; Ik: 6; Soo: 2.
C: Maba: 7; Masalit: 8; Aiki: 7; Mimi: 2
D: For 10; Amdang: 2
F: Fp: 6; Fc: 6
G: Berta: 7
H: Kunama: 8; Ilit: 3
E: Ek: 8; En: 10
I: Twampa: 3; Komo: 2; Opo: 2; Kwama: 5; Gule: 3
J: Sai: 4; Kokit: 1; Sese: 3; Conti Rossini item 1
L: Kadalla: 10; Krongo: 5; Tulishi: 5.

The numbers reflect strength of documentation and over-representation of the "Outliers" as well as possible retentions of protoforms. Thus it is hard to judge them beyond noting that it is not surprising that there are some very low scores, including two ones (B Berti and a J item from Conti Rossini). I did not carry out this count beyond the first 16 (the excellent isoglosses).

8. (p. 77) I want to emphasize that morpheme cuts indicated by + in the tables are either those attested in the literature, or obvious by inspection, or hypothetical, based on making the items in question fit into putative cognate sets. Some are undoubtedly wrong. In my 1989b and 1991 articles on N-S grammar, I did not consider the categories of possible noun or verb morphological classes. A thorough comparative analysis of noun and verb (and other) formatives in N-S should be one of the next steps in comparative N-S work.

9. (p.78) The unique *D-/k-* noun sg./pl. formatives in For is the evidence which led Greenberg (1972) to solve the puzzle of one of the various "Mimi" languages reported in the general area of Chad. The "Mimi" in question is that of Jungraithmayr (1971) for which Paul Doornbos (1980) provided much additional lexical data under the name "Biltine", a place-name of the area. The name of the people is Amdang, which I use in place of the ambiguous "Mimi".

Notes to 3rd Chapter

1. (p. 117) Of course, the principle of arbitrariness has been stated many times in many ways, none more famous that that of the Swiss linguistic pioneer, Ferdinand de Saussure, in works too well-known to need reference here.

One should be aware that there is still a question of possible genetic/areal interaction. It is quite possible that a form started in one language family and spread to many others, perhaps in an altered form. One could study the distribution of specific forms (e.g. with *t-* vs. *t'-* or *-p* vs. *-f)* to look for evidence of phonological isoglosses- I have found this to be a frustrating exercise with no good results so far.

2. (p. 118) I believe that monogenesis is indeed likely, dating back to the "sapienization" period of 100,000-200,000 years ago. But, contrary to "World Etymologists", I do not believe it is possible to reconstruct a "Proto-Human" (for my reasoning, see Bender 1973). We must ascribe proposed "world etymologies" such as (giving the English forms): 'cut' *KUT* , 'fly' *PVR* , 'index' *DEK ~ TIK* to chance. The "world etymologists" have not faced up to the problem of the role of chance, given the enormous phonological and semantic latitude they allow in proposing their "etymologies". It is a statistical problem. See Ringe 1992 and his references.

Notes to 5th Chapter

1. (p. 158) The text is numbered 1-49 but has pp. 30A,B and 31A,B. The list is not numbered. In my numbering I accidentally omitted 361 and also found that p. 65 duplicates 64 and 286 duplicates 269 so that the last page is numbered 423, although there are really only 420 different pages.

2. (p. 168) Ehret 1989: 37 states that the published version will have 1400-1500 "early N-S roots".

3. (p. 171) There is an indication that the structure of N-S assumed in the 1984ms. and text was somewhat different from that in the 1989 article. But even so, the list of langauges used to set up phonological correspondences in the text indicates the same disregard for intermediate structures such as "Sudanic" and"Saharo-Sahelian" and the use of single languages for others. See. 5.5.

Appendix A: Summary of Nilo-Saharan Linguistic/Cultural Information
A1: Population Estimates

In the following list, no attempt has been made to present all the alternative population estimates (e.g. T & B 1956 from census and taxpayer data, Hair 1966, Thelwall 1978 largely from older sources). What is given is a set of the most recent estimates I could locate in 1988, many from scholars who have done research in the areas in question in the past decade or so. The figures from *Ethnologue* (Grimes, ed. 1988) are used if appropriate; these often make use of the estimates just mentioned, but are usually from the period 1985-87. In the case of older estimates (especially for the larger groups), in order to arrive at a comparable set of figures in A1, a "normalization" to 1988 has been calculated, based on the natural increase rates for the various countries involved as given in the 1992 *World Almanac*. These rates are as follows (excluding Algeria, with a few hundreds or thousands of speakers of Northern Songay).

Benin: 3.7%
Burkina Faso: 2.9%
Cameroon: 2.6%
Central African Republic: 2.5%
Chad: 2.0%
Egypt 2.5%
Ethiopia: 3.1%
Kenya: 4.2%
Libya: 3.1%
Mali: 2.9%
Niger: 3.2%
Nigeria: 2.9%
Sudan: 3.0%
Tanzania: 3.4%
Uganda: 3.4%
Zaire 3.1%

The "normalized" figures in A2 are given in [ ]. The figures of A1 and Column 5 of A2 are not always to be taken as very reliable, given the many problems underlying their estimations. They probably underestimate in most cases, especially those which are based on older colonial data.

A Songay	2,100,000	E1 Nubian	803,000
B Saharan	3,923,000	E2 Surmic	246,000
C Maban	505,000	E3 Nera	40,000
D Foran	516,000	E4 Jebel	103,000
E E. Sudanic	15,446,000	E5 Nyima	93,000
F C. Sudanic	3,741,000	E6 Temein	28,000
G Berta	100,000	E7 Tama	185,000
H Kunama	100,000	E8 Daju	187,000
I Koman	36,000	E9 Nilotic	13,761,000
J Gumuz	90,000	(Nilotic-a	8,344,000
K Kuliak	5,000	Nilotic-b	3,641,000
L Kadu	94,000	Nilotic-c	1,776,000)
Nilo-Saharan Total:	26,656,000	E Total:	15,446,000
F1-3 "Sara-Bongo-Modo"	1,404,000	F7 Kresh	17,000
F4 "Moru-Madi"	1,037,000	F8 Baadha	490,000
F5 "Mangbutu"	143,000		
F6 "Mangbetu"	650,000	F Tl.:	3,741,000

3. Leading Languages: (rounded to nearest 50,000)

1. Borno (of B)	3,500,000	9. Bari (E9b)	700,000
2. Luo (Kenya) of E9a	3,250,000	9-10. Maa (E9b) and	650,000
3. Songay (A)	2,100,000	Mangbetu (F6)	650,000
4. Acoli-Lango-Alur	1,850,000	11. Sara-Ngambay (F1a)	600,000
5. Kalenjin (E9c)	1,650,000	12. Logbara (F4)	550,000
6-7. Jieng (E9a)	1,350,000	13-17. For (D)	500,000
Teso (E9b)	1,350,000	Dongola(E1)	500,000?
8. Naadh (E9a)	850,000	Baadha (F8)	500,000

Because of doubtful validity even for 100,000's, it might be best to condense the above into about six groups (in millions): (1) Borno and Luo ca. 3.5 each, (2) Songay and Acoli, etc. ca. 2 each, (3) Kalenjin, Jieng, and Teso ca. 1.5 each, (4) Naadh ca. 1, (5) Bari, Maa, Mangbetu ca. .75 each, (6) all the rest about .5 each. Dongola is doubtful: while other sources estimate about 200,000; *Ethnologue* gives 750,000 to 1 million.

Sources of Population Figures — * Means found in References

Some of these sources are "covered up" in the table because they are primary sources used by *Ethnologue*, which is given as source where appropriate.

AJ Angelika Jakobi p.c. 1988
AV Anton Vorbichler 1965*
BH Bernd Heine 1976b*
BM Bender and Malik 1980*
CC Chet Creider p.c. 1988
DLG D.L. Goyvaerts p.c. 1988
DRB D. Richard Brown p.c. 1988 (as of 1983)
DT David Turton p.c. 1988
E Ethnologue 1988
EDT E. David Thompson 1976 a, b*
FR Franz Rottland 1983*, p.c. 1988 (Kenya Census 1979); also 1982*
GD Gerrit Dimmendaal 1983*, 1986*
GPM George P. Murdock 1959*
JA Jon Arensen 1982*
JK John Keegan p.c. 1988
JPC Jean-Pierre Caprile 1978*
KC Kenya Census 1978
MF Maurice Fournier p.c. 1988
MLB M. Lionel Bender field notes (1968-70, 1973-77, 1980-81),1989a*
MN Michael Noonan 1988 (data from 1980 Uganda census)
PD Paul Doornbos: from Doornbos and Bender 1983*
PU Peter Unseth p.c. 1988 (incl. Eth. census 1985)
RCS Roland C. Stevenson 1981*
RT Robin Thelwall 1978*
RV Rainer Vossen 1983*
RW Roland Werner 1987*
SD Samuel Decalo 1977*
TAB Triulzi, Atieb, Bender 1976*
TB Tucker and Bryan 1956*
Tl Total of group in question
TS Thilo Schadeberg p.c. 1988
WA World Almanac 1992*
WJ Wendy James 1979*
WM William Muldrow 1976*

A2: Nilo-Saharan Linguistic/Cultural Information

Key to Abbreviations in Appendix A2:

Number and group, language name: see section 1.2.2.1 above; † extinct
Type: see section 1.2.4.
Number of native-speakers. Tl.: total for group in question. [ ] used for updated figures from older estimates based on natural rates of increase (see in A.1).

Subsistence (1.3.3.1)

P Pastoral
PP Primarily pastoral
HA1 Hoe agriculture-Prenilote
HA2 Hoe agriculture-Nilote
AH Animal husbandry
H Hunting
F Fishing
G Gathering
T Trade
Eg Egyptian
Sud> Sudanic prevails
ag agriculture
Ir Irrigation

Political Structure (1.3.3.2):

S State
K Subsidiary kingdom
H Headman or chief
Ch Chief
Sv Slaves
C Castes
AG Age-grading
DC Dependent castes among other ethnic groups
R Regicide
Ter Terraces

Religion (1.3.3.3): Religious affiliations are listed in the table in descending order of estimated strength. E.g. "T, C, I" means "a plurality of Traditional, some Christians, fewer Muslims".

I Islam C Christianity T Traditional
T–>I Islamization in process (noted in passing for only one group, though in process over a wide area).

GROUP		LANG.	TYPE	#SPEAKERS	SUBSIST.	POLIT.	RELIGION
1	A	S. Songai =Songai- Zerma-Dendi	B(D),	2.1 million E	HA,AH,F,T, Sud>Eg, Ir	S: 1450-1590	I,C,T
2		N. Songai	B(A)	Few thousand?	PP, T?		I
3	B	Kanuri- Kanembu		3.5 million E	HA,AH,T, oasis ag.	Tribal sultan, C, Sv	I I,T
4		Teda- Tubu	All: D	200,000 E [300,000]	HA,AH, T	Tibal sultan, C	I
5		Zagawa- †Berti		122,500 E Berti 9 RT	PP,T Berti: HA, T	S: Wadai, Darfur	I,T
6	C	Bora- Mabang	D	150,000 PD 56,000 E			
7		Masalit	D	250-300,000 PD	HA,AH,F, T,Ir		

GROUP		LANG.	TYPE	#SPEAKERS	SUBSIST.	POLIT.	RELIGION
8		Aiki- -Kibet	D	Ai: 28,000 E K: 22,000; E [27,000]		All: S Wadai,	All: I
9		Mimi GD	?	Few	Sud > Eg	Darfur	
10		Mimi N	?	Few			
11	D	For	D	501,000 E	HA,AH,T	S: Darfur	I
12		Amdang	?	5,000 PD; 15,000 E D Tl: 530,400 AJ	Sud > Eg		I
E,F See after L							
13	G	Berta	A	60-70,000 TAB 66,000 in Eth.: PU Tl: 100,000 MLB	HA1,AH, F,H	K: under Funj, R	T,I
14	H	Kunama	D	70,000 EDT [100,000]	HA1,AH,F,H	R	T,C,I
15	I	T'wampa		11,000 E		Ko: Heredit.	T,C
16		Komo	All:	4,500 E	All:	Village C	I,C,T
17		Opo	A	2-5,000 E	HA1,AH,F,H		T?
18		Kwama		15,000 E			I,T
19		†Gule		6 MLB; all but extinct		K: under Funj	I
20	J	Gumuz	A	90,000 PU	HA1,AH,F,H	R	T,I,C
21	K	Nyangi	All:	< 100; dying out BH	All: until recently:	AG reported	T
22		Ik	C	1000-1500 BH	HG; now HA?		C,T
23		Soo		2-4000 BH	some are DC among Nandi		T
24	L	Tulishi		9000 E	All: Sud,	All:	T,I
25		Kadalla =Kadugli	All: A	50-70,000 E	HA,AH, Ter, Ir	AG common, Sv	T,I?
26		Krongo		15,000 E			T,I,C
E: East Sudanic:							
27	E1	Nobiin		200,000 RW	HA,Sud>Eg, AH,T		I
28		Midob	All:	21,727 RT; [28,000]	PP,T	Christian	I
29		†Birgid	D	59, dying out RT	PP,T	Kingdoms	I ?
30		Dongola		200,000 RW 750,000-1 mil E [compromise: 500,000]	HA, Sud>Eg, AH,T	on Nile up to ca. 1300	I
31		Hill		25,000? E	HA, Sud>Eg, AH		I,T
32	E2	Majang	C	50,000 PU	HA2,H,G	Ch	
33		Murle, Didinga, etc.	C	133,000 E	PP,HA2,F, (but F tabu to Didinga)	AG	

GROUP		LANG.	TYPE	#SPEAKERS	SUBSIST.	POLIT.	RELIGION
34		Bale (Zilmamu)	?	2-3000 E	HA^2	?	
35		Suri, Mursi, etc.	A	20,000 E M: 5000 DT	PP,HA,Ter.? F,T	AG, petty paramount chief	
36		Me'en	A(B)	40,000 E	T:HA^1,Bo:PP	Bodi: AG	All: T
37		Kwegu-Muguji	A	300 DT, 600 WM	H,HA^2 until recently		
38?		Shabo	D	600 PU	H, resettled as HA		
		(may belong under I or elsewhere; perhaps not N-S)					
39	E3	Nera	D	25,000 EDT [40,000]	HA^2,AH,F		I
40	E4	Gaam		80,000 BM [100,000]	Ch		T
41		Aka	All:	few			
42		Kelo	A	hundred	HA^2,AH,F		I
43		Molo		each MLB			
44	E5	Nyimang	D	70,000 E	Both: Sud.	K on Eg	Both:
45		Dinik	D	4500 E Tl: 93,000 AJ	HA ,AH, Ir, Ter	model, 543 AD	I, T
46	E6	Ronge	A	10,000 E	Both: Sud,		
47		Doni-Dese	A	1,400 E [2000] TL: 28,000 AJ	HA, AH, Ir,Ter		Both: T,I?
48	E7	Tama		60,000 E			
49		Erenga-Sungor	All: D	E: 7500 E S: 60,000 E	All: Sud, HA,AH,F	K under Darfur, Wadai	All: I
50		Merarit		65,000 PD; 42,000: E TL: 105,000 E			
51	E8	Shatt	A	15,000 E			T?
52		Liguri	A(B)	2,000 E [3000]	All: HA, AH		I, T
53		Nyala	?	70-90,000 E		K under Darfur, Wadai	
54		Nyolge	A(B)	900 E			All
55		Mongo	?	27,000 E [35,000] F			others: I
56		Sila	D	33,000 E [43,000]			
57		†Beygo	?	Nearly extinct RT,PD Tl:100,000? PD			
E9: Nilotic							
58	E9a	Burun	?	18,000 E [22,000]	HA^2,AH,F	K: under Funj	
59		Mebaan-Jumjum	?	50-102,000 E	HA^2,AH,F		
60		Colo (Shilluk)	A	175,000 E	HA^2,AH,F	S: conquest state	
61		Anywa	C ~ D	71,000 E	HA^2,AH,F	R of Ch	

GROUP		LANG.	TYPE	#SPEAKERS	SUBSIST.	POLIT.	RELIGION
62		Jur	A	54,000 E	HA^1, AH	Sv	Most: T,C,I
63		Turi	?	154,000 E	HA^1, AH	AG	
64		Bor	?	18,000 E	PP		
65		Acoli,	A	Ac: 674,000 E	HA^1,H,G,F,	Indep. Chief	C,T
		Lango,	A	L: 400,000 MN	Sud>Eg		
		Alur, etc.		Alur: 780,000 E			T,C
66		Kumam	?	147,000 E	PP	Alur: Sv	
67		Adola	?	235,200 E	HA, AH,		
68		Luo	A	3,243,000 E	HA^1, AH	Dominant clans	C,T,I
69		Jieng (Dinka)	A	1,350,000 E	PP/HA^1,AH	"Spear Chiefs"; Sv	
70		Naadh (Nuer)	A	840,000 E	PP,HA^1,AH	"Leopard-Skin Chiefs"	
71		Atuot	?	25,000 E	PP,HA^1,AH		
72	E9b	Bari-Kakwa	A	B: 340,000 E [476,000] K: 148,000 E [267,000]			T,C
73		Lotuko		185,000 E		4-fold strat-ification	T,C,I
74		Maa		657,000 E			T,C
75		†Ongamo	All others:	1000, dying out RV	PP, HA^1 F, but	C: smiths	Others: T,
76		Toposa	C	105,000 E	fish tabu	AG	C, I
77		Turkana		250,000 E [363,000]	to Masai, Karamojong		
78		Karamojong		294,000 E			T,C
79		Teso		1,352,600 E	HA^1,AH,F	Sv	C,T
80	E9c	†Omotik	C?	20 FR, nearly extinct	All: PP,HA^1,AH;	All: C, Smiths	
81		Datooga	A	104,000 E	F tabu to		T
82		Kalenjin	C	Total ca. 1,672,000 E	Nandi		C,T
83?		†Meroitic not treated here: maybe not E.S or even N-S					
Central Sudanic:							
84	F1a.1	Sar	A	200,000 PF; 50,000 E	Both: HA,H	Sv	T, C
85		Mbai	A	100,000 E	G, F, Sud	Sv	T, C
86		Barma (Bagirmi)	A	30-40,000 E			I
87		Kuka	?	38,000 E [49,000]	HA, AH,		I
88		Kenga	?	20-25,000 E	Sud, Ir		T-->I
89	F1a.2	Ngambai	A	600,000 E			T,C,I
90		Kaba(Goze)	?	11,000 E [14,000]			
91	F1a.3	Doba	?	250,000 PF	All: HA	All: Sv	

GROUP	LANG.	TYPE	#SPEAKERS	SUBSIST.	POLIT.	RELIGION
92 F1a.4	Kaba-Dunjo	?	50,000 PF			
93 F1a.5	Vale	?	1400 E			T ?
94 F1b	Yulu-Binga	A	3000 E			T ?
95 F1c	Fongoro					
96 F1d	Shemya (Sinyar)	A	5-10,000 PD	Sud,H,F,G		I ?
97 F1e	Fer (Kara)	A	800 or 1-2000E?	Sud,HA,H,F,G	Sv	T
98 F2	Bongo	A	5-10,000 E			T,C
99 F3	B'eli (Modo)	A	22,000 E	Some PP		T ?
100	Baka	A	24,300 E	All: Sud,	All: Ch	
101	Morokodo	?	3,400 E	HA, H, F		C,T ?
102 F4.1	Moru		70,000 E			T
103 F4.2	Avokaya	All:	15,000 E			T
104	Logo	A,	150,000 E	All:		T
105	Keliko	some	18,000 E [25,000]	HA,Sud,H,F,G		T
106	High Lugbara	B	Lug. Tl: 544,000 E			C,T
107	Low Lugbara					
109 F4.3	Madi		233,000 E			T,C
						T ?
109 F5.1	Mangbutu	?	8,000 E [12,000]	All: HA,H,	Sv	T,C
110 F5.2	Ndo	?	13,000 E [19,000]	bananas,		T,C
111 F5.3	Mamvu	A(B)	40,000 E [60,000]	yams	Sv	
	-Balese	A	35,000 E [52,000]	F,G, no		T
	-Efe	?	Few	cattle		
112 F6.1	Mangbetu	A(B)	650,000 E	HA,H,F,G	Conquest	T
113 F6.2	Asua (Aka)	?	Few	no cattle	State, Sv	T
114 F7	Kresh	A	16,000 DRB			I,C
115	Aja	A	1000 DRB	no cattle		I ?
116 F8	Badha	A(B)	490,000E	HA,H,F,G, no cattle		C,T

INDEX 1: Highest-Level Reconstructed Forms by Semantic Sets

This index lists *only highest-level reconstructions* for a given numbered item so that Level III is given if it occurs, Level II is given and marked as such if it occurs and Level III does not, and Level I if this is the only level reconstructed. These are set against semantic sets from No. 1 to 50 with brief descriptions of the contents of each set. Items in parentheses are marginal in the sets in question: they are found also under a main heading. E.g. Item #78 has the main heading S.S. 12 (water, sky, etc.) but also has a marginal entry under S.S. 4 (internal organs, inside, outside).

46 house/yard, furniture: 42 ***kar+**, 100 **bEr+**, 128 **kar+**, 188 II **kud+u**, 204 I **dal+a**, (224 I **Kub**), 238 I **šul+i**.

47 body/clothes, self: 67 ***Or$_2$+**.

48 salt, taste: 305 II **aŋgO ~ ka**, 322 II **kOr+**.

49 open, pour, put, etc.: 30 ***d$_2$o**, 34 ***fVt**, 86 ***TOr**, 99 **ber+**, 118 **fe/ir**, 141 **k^{h}a+i**, 153 **ru+ ~ ur+**, 178 II **a+wa**, 215 I ***(i+)ši**, 217 I **kal+**, 237 I **suaR**, 251 I **tuš**, 256 I **(w)Or**.

50 animal varieties other than S.S 17, 41: 96 **baŋ+ ~ buŋg+Vr**, 151 **(ŋ)ga(a)r+**, 191 II **murt+**, 213 I ***go**, (290 **kok+o**), 297 II ****KUr**, 299 **Oŋor**.

INDEX 2: English Glosses by Reconstructions

Numbered references are to reconstructions in Lists A-E *including notes found at ends of some items*. There are about 545 glosses.

UNUSED ITEMS

These are items on the elicitation list which did nos show up in isoglosses. Most grammatical items were excluded from this work. Some synonyms may actually have occurred but were not listed in order to save space (e.g. 'drip' ='drop', 'fireplace'='hearth', 'firewood' ='wood', 'chicken' = 'fowl'). Total: 187.

again, allow=permit, always, and, annoy=disturb, anyone, at,
bald, bamboo, banana, baobab, bat (animal), beads=necklace, beans, become, bedbug, begin, bless, blind, blue, brain, bridge, brown, but,
camel, can=be able, cease=quit, cheek, chicken, circle, circumsize, coffee, corpse, cotton, crowd, cure,
divorce, door(way), drip, dry, dumb, dwarf=pygmy,
ear, eight, empty, enemy, evening, everywhere, eyebrow,
fear, feces, fig, fireplace, firewood, five, floor, flower, forge,
goodbye, grass, groundnut=peanut,
hail, hare=rabbit, harvest=crop, hate, have, he (often =she), headrest, hello, here, hide=skin, hide=conceal, high, how?, how many?, hundred,
I, immediately, inset (false banana), island,
jaw, kick, kindle=ignite, kiss,
ladle, last (final), leaf, lip, lizard, locust,
mad=crazy, maize, market, mat=carpet, mead, meet, music,
naked, net, nine,
onion, ostrich, over,
pain, palm tree, pea(s), pepper, please, poor, porcupine, punish, python,
rainbow, rat, rich, road=path,
sad, saw (n.), scratch, self, sell, seven, sick, six, slow, smith, sneeze, squeeze, steal, stoop, storm, sweat,
t'ej (Ethiopian mead), tendon, thank you, that, there, they, thing, this, thou, thunder, thus=so, together, too much, touch, tribe=nation, twins,
under, untie,
Venus, vomit, vulva,
wall, warm=hot, warrior, we, what?, when?, where?, which?, who?, why?, wise, wrist, wrong,
ye, zebra.

INDEX 3: All Reconstructed Forms

This index contains a summary of the reconstructed forms found in Lists A-E by number of item. Levels (III, II, I) and degrees (**, *, no star) are omitted and idiosyncrasies such as morpheme-breaks and suffixes are omitted where not needed.

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University Presses are given simply as MIT, Oxford, Texas, etc.

Abbreviations:

AA	American Anthropologist
AAP	Afrikanistische Arbeitspapiere
AJPA	American Journal of Physical Anthropology
AL	Anthropological Linguistics
ALR	African Language Reviews
ALS	African Language Studies
AM	Africana Marburgensia
ASC-MSU	African Studies Center-Michigan State University
AUU	Afrika und Übersee
BSOAS	Bulletin of the School of Oriental and African Studies
CA	Current Anthropology
CNRS	Centre National de la Recherche Scientifique
HBJ	Harcourt, Brace, Jovanovich. New York.
HRW	Holt, Rinehart, and Winston. New York.
IFAN	Institut Français d'Afrique Noire
IJAL	International Journal of American Linguistics
JAL	Journal of African Languages
JALL	Journal of African Languages and Linguistics
JPCL	Journal of Pidgin and Creole Languages
JRAI	Journal of the Royal Anthropological Institute
KBA	Kölner Beiträge zur Afrikanistik
N-SLAD	Nilo-Saharan Linguistic Analyses and Documentation
P-H	Prentice-Hall. Englewood Cliffs.
RSO	Rassegna di Studi Orientali
SA	Scientific American
SAL	Studies in African Linguistics
SJA	Southwestern Journal of Anthropology
SNR	Sudan Notes and Records
SUGIA	Sprache und Geschichte in Afrika
ZKS	Zeitschrift für Kolonialsprachen

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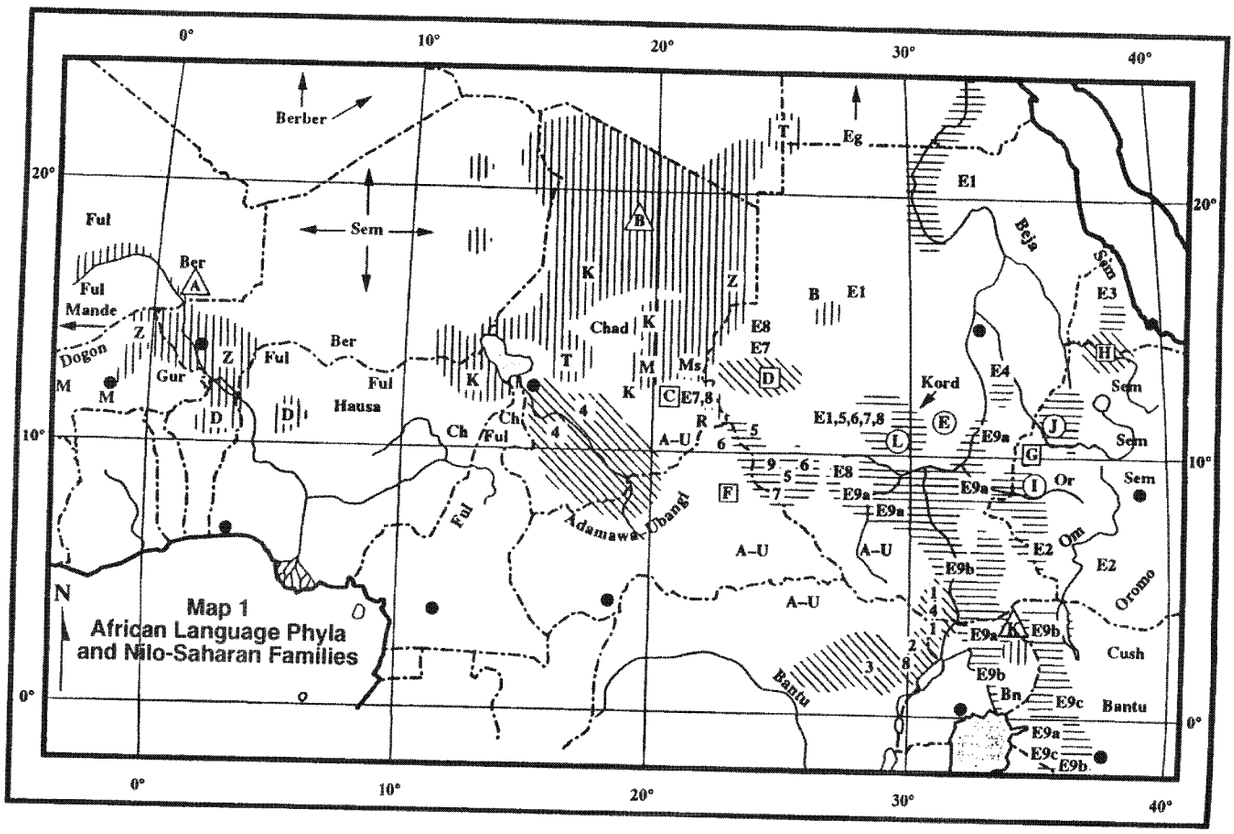

Map 2: NILO-SAHARAN LANGUAGE LOCATER Key in text: 1.2.2.1