

*The Current status of Nostratic Studies*

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*Abstract:* The article is an up-to-date introduction to Nostratic, as reconstructed by Allan Bomhard. It comprises an historical introduction, a phonological survey of Nostratic and of the daughter languages, a presentation of sound correspondences and the morphology of Proto-Nostratic. Bomhard's approach is also compared with that of Dolgopolsky.

*Keywords:* Nostratic, Phonology, Morphology.

1. *Historiographical background*

The Nostratic Hypothesis got its start in 1903 with a suggestion by the Danish Indo-Europeanist Holger Pedersen that a number of languages/language families of northern Eurasia and the ancient Near East might be genetically related (cf. Pedersen 1931:335—339). He coined the term “Nostratic” to refer to this proposed grouping of languages. Early work was done by a small number of scholars on the question of distant linguistic relationship, but most of that work was of poor quality and was, consequently, largely ignored by mainstream linguists. It was not until the mid-1960s that the Russian linguists Vladislav M. Illič-Svityč and Aharon Dolgopolsky began to make meaningful progress in reconstructing the Nostratic parent language. Subsequently, a number of other scholars in other countries began making important contributions as well — these include: Václav Blažek, Allan R. Bomhard, Joseph H. Greenberg, Alexis Manaster Ramer, and Vitaly Shevoroshkin, among others. Two schools have come into being, namely, the Moscow School, whose chief spokesman is Aharon Dolgopolsky, and the American School, whose chief spokesman is Allan R. Bomhard. Serious work continues unabated (see below).

2. *Evidence for Nostratic*

The following evidence provides the basis for setting up a Nostratic macrofamily:

1. First and foremost, the descendant languages can be shown to share a large common vocabulary. In an article published in 1965, Illič-Svityč listed 607 possible common Nostratic roots, but only 378 have been published to date in his posthumous comparative Nostratic dictionary (1971— ). Since the early 1960s, Dolgopolsky has been gathering material for a new Nostratic dictionary and currently has material to support approximately 3,000 common Nostratic roots<sup>1</sup>. It may be noted that Bomhard (2009) has prepared a critical review of this work. In the joint monograph (1994) by Allan R. Bomhard and John C. Kerns, entitled *The Nostratic Macrofamily: A Study in Distant Linguistic Relationship*, 601 common Nostratic roots were listed, and another 50 were proposed by Bomhard in a later article (1995). Bomhard's most recent work, entitled *Reconstructing Proto-Nostratic: Comparative Phonology, Morphology, and Vocabulary*, has recently (2008) been published by E. J. Brill<sup>2</sup>. Volume 2 of this monograph (942 pp.) is devoted to comparative

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<sup>1</sup> His *Nostratic Dictionary* is available at: <http://www.dspace.cam.ac.uk/handle/1810/196512>.

<sup>2</sup> [http://www.brill.nl/product\\_id30791.htm](http://www.brill.nl/product_id30791.htm)

vocabulary. In it, Bomhard supplies material to support the reconstruction of 843 common Nostratic roots. In volume 2 (2002) of his book entitled *Indo-European and Its Closest Relatives: The Eurasiatic Language Family*, the late Joseph H. Greenberg presented a large amount of lexical material to support the reconstruction of his Eurasiatic Macrofamily (Eurasiatic may be viewed as a branch of Nostratic). In a number of articles, the Czech scholar Václav Blažek has also made many important contributions to the reconstruction of the common Nostratic vocabulary. It should be noted that there are many shared etymologies in the works of these different scholars.

2. As is to be expected, the various branches of Nostratic investigated to date exhibit regular sound correspondences (see the Appendix at the end of this chapter for details), though, it should be mentioned, there are differences in interpretation between Illič-Svityč and Dolgopolsky on the one hand and Bomhard on the other.
3. Finally, a substantial number of common grammatical formants have now been recovered — many of these are listed in Illič-Svityč's comparative Nostratic dictionary (1971— ); see also Dybo (2004), the chapter on Nostratic morphology by John C. Kerns in Bomhard—Kerns (1994:141—190), volume 1 of Greenberg's *Indo-European and Its Closest Relatives: The Eurasiatic Language Family* (Greenberg 2000), and Chapters 16 and 17 of Bomhard's recent book *Reconstructing Proto-Nostratic* (Bomhard 2008.1:273—415).

Notable among the lexical items uncovered by Illič-Svityč, Dolgopolsky, Greenberg, and Bomhard is a solid core of common pronominal stems. These pronominal stems have particular importance, since, as forcefully demonstrated by John C. Kerns (1985:9—50), pronouns, being among the most stable elements of a language, are a particularly strong indicator of genetic relationship. Ruhlen (1994:92—93) makes the same point, as did Björn Collinder before him.

The conclusion seems inescapable that the consistent, regular phonological correspondences that can be shown to exist among the Nostratic daughter languages as well as the agreements in vocabulary and grammatical formants that have been uncovered to date cannot be explained as due to linguistic borrowing or mere chance but can only be accounted for in terms of common origin, that is, genetic relationship. To assume any other possibility would be tantamount to denying the efficacy of the Comparative Method. This does not mean that all problems have been solved. On the contrary, there remain many issues to be investigated and many details to be worked out, but the future looks extremely exciting and extremely promising.

### 3. *The Perimeter of Nostratic according to Bomhard*

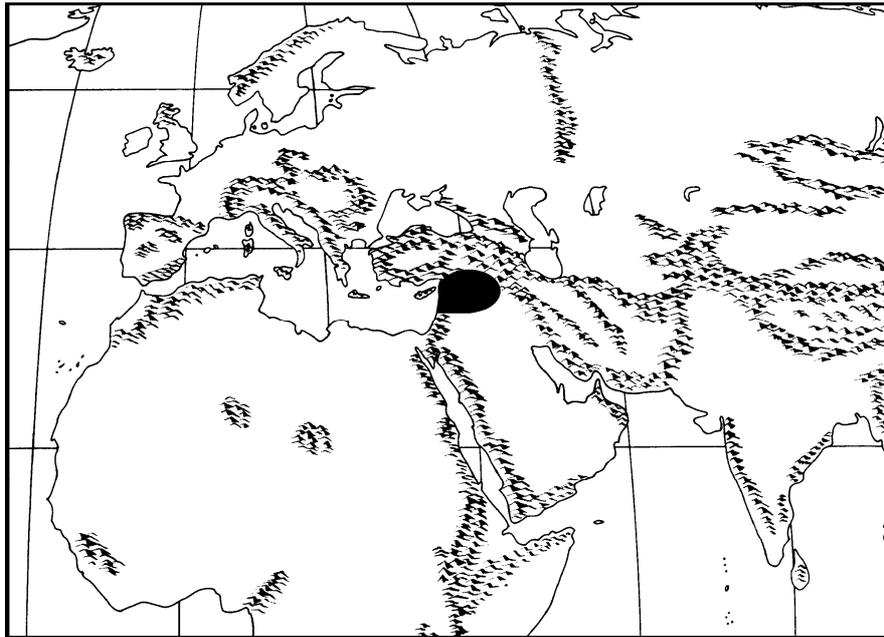
At this stage of research, we can confidently say that the following languages/language families are to be included in the Nostratic macrofamily: Afrasian (also called Afroasiatic, Hamito-Semitic, Semito-Hamitic), Elamo-Dravidian, Kartvelian, and Eurasiatic. Eurasiatic, in turn, includes the following: Tyrrhenian (Etruscan, Raetic, and Lemnian), Indo-European, Uralic-Yukaghir, Altaic (Tungus, Mongolian, and Turkic), Chukchi-Kamchatkan, Gilyak (also called Nivkh), and Eskimo-Aleut. Other languages may belong as well, such as, for example, Korean and Japonic (Japanese-Ryukyuan). But much work needs to be done before these two groups can be convincingly shown to be related to Altaic (itself quite controversial), as is often assumed, let alone Nostratic.

### 4. *The Nostratic homeland in Bomhard's framework*

Analysis of the available evidence has enabled us to determine the most likely homeland of the Nostratic parent language, to establish a time-frame during which Proto-Nostratic might have been spoken, to date the disintegration of Proto-Nostratic, and to trace the early dispersal of the daughter languages. The following scenario emerges: The unified Nostratic parent language may be dated to between 15,000 to 12,000 BCE, that is, at the end of the last Ice Age — it was most likely located in the Fertile Crescent just south of the Caucasus Mountains. Beginning around 12,000 BCE, Nostratic began to expand, and, by 10,000 BCE, several distinct dialect groups had appeared. The first to split

off from the main speech community was Afrasian. One dialect group spread from the Fertile Crescent to the northeast, eventually reaching Central Asia sometime before 9,000 BCE — this was Eurasiatic. Another dialect group spread eastward into western and central Iran, where it developed into Elamo-Dravidian at about 8,000 BCE. If Johanna Nichols is correct in seeing Pre-Proto-Kartvelian as having migrated from Central Asia westward below the Caspian Sea to the Caucasus, this would seem to imply that Pre-Proto-Kartvelian had first migrated northeastward from the Fertile Crescent along with or as part of Pre-Proto-Eurasiatic, that it stopped somewhere along the way, and that it then returned to the Middle East. For details, cf. Dolgopolsky (1998) and Bomhard (2008.1:221—252).

The following map shows the approximate location of the Nostratic homeland around 15,000 BCE (cf. Bomhard 2008.1:246):



Map1: Nostratic homeland according to Bomhard

5. A sketch of Nostratic phonology according to Bomhard

Proto-Nostratic had a rich system of stops and affricates. Each stop and affricate series was characterized by the three-way contrast (1) voiceless (aspirated), (2) voiced, and (3) glottalized. The aspiration of series (1) was phonemically non-distinctive.

According to Bomhard (2008.1:213—220), the Proto-Nostratic phonological system may be reconstructed as follows:

Stops and Affricates:

p <sup>h</sup>	t <sup>h</sup>	c <sup>h</sup>	č <sup>h</sup>	tʰ <sup>y</sup>	tʰ <sub>ɟ</sub>	k <sup>h</sup>	k <sup>wh</sup>	q <sup>h</sup>	q <sup>wh</sup>	
b	d	ʒ	ž	dʸ	dʒ (?)	g	g <sup>w</sup>	ɠ	ɠ <sup>w</sup>	
pʻ	tʻ	cʻ	čʻ	tʻ <sup>y</sup>	tʻ <sub>ɟ</sub>	kʻ	kʻ <sup>w</sup>	qʻ	qʻ <sup>w</sup>	ʔ

Fricatives:

s	š	sʸ	x	x <sup>w</sup>	h	ħ
z	ž (?)	zʸ (?)				ʕ

Glides:

w y

Nasals and Liquids:

m n nʸ ŋ  
l lʸ  
r rʸ

Vowels: i (~ e) u (~ o)  
e o  
(ə ~) a

Also the sequences: iy (~ ey) uy (~ oy) ey oy (əy ~) ay  
iw (~ ew) uw (~ ow) ew ow (əw ~) aw

6. A comparison with Dolgopolsky's approach

While the actual reconstruction of the Proto-Nostratic phonological system is fairly close, Dolgopolsky and Bomhard arrive at their reconstructions through two different sets of sound correspondences. Though Dolgopolsky mostly adheres to the sound correspondences originally established by Illič-Svityč, he does make some modifications based upon his own research. Illič-Svityč did not prepare a table of Nostratic sound correspondences himself, but the work was done for him by his friend Vladimir Dybo and included at the beginning of volume 1 (pp. 147—171) of Illič-Svityč's posthumous Nostratic Dictionary (1971-). The following table is taken from p.147 of this dictionary and includes only the stops:

Nostratic Initial Medial	Afrasian	Kartvelian	Indo-European	Uralic	Dravidian	Altaic
pʼ-	p	p, p̣	p	p-	p-	pʼ-
-pʼ-	p	p	p	-pp- ~ -p-	-pp- ~ -p-	-p- ~ -b-
p-	p <sub>1</sub>	p <sub>1</sub> (p ~ b)	p ~ b	p-	p <sub>1</sub> - (p ~ v-)	p-
-p-	p <sub>1</sub>	p <sub>1</sub> (p ~ b)	p ~ b	-p-	-pp- ~ -v-	-b-
b-	b	b	bh	p-	p-	b
-b-	b	b	bh	w-	-?- ~ -v-	-b-
ṭ-	ṭ (t)	ṭ	t	t-	t-	tʼ-
-ṭ-	ṭ (t)	ṭ	t	-tt- ~ -t-	-t(t)-	-t-
t-	t	t	d	t-	t-	t-
-t-	t	t	d	-t-	-t(t)-	-d-
d-	d	d	dh	t-	t-	d-
-d-	d	d	dh	-δ-	-ṭ(t)-	-d-
ḳ-	q (k)	ḳ	ġ, k, k <sup>u</sup>	k-	k-	kʼ-
-ḳ-	q	ḳ	ġ, k, k <sup>u</sup>	-kk- ~ -k-	-k(k)-	-k- ~ -g-
k-	k	k	ġ, g, g <sup>u</sup>	k-	k-	k-
-k-	k	k	ġ, g, g <sup>u</sup>	-k-	-k(k)-	-g-
g-	g	g	ġh, gh, g <sup>uh</sup>	k	k-	g-
-g-	g	g	ġh, gh, g <sup>uh</sup>	-γ-	-:Ø-	-g-

Table1: Nostratic sound correspondences for stops according to Dolgopolsky

Dolgopolsky proposes the following Nostratic sound correspondences (as above, only the stops are given):

Nostr.	Sem.	Eg.	Berb.	Kart.	IE	Uralic	Turk.	Mong.	Tung.	Drav.
*b-	*b	b	*b	*b	*b <sup>h</sup>	*p	*b	*b	*b	*p
*-b-	*b	b	*b, *β	*b	*b <sup>h</sup>	*w, β_/*p	*b	*b	*b	*v
*p-	*p	f	*f	*p	*p, *b	*p	*b, *p ·	*φ, ?*b	*p	*p
*-p-	*p	f	*f	*p, ?*b	*p, *b	*p, ?*w	*∅	*φ > *γ	*b	
*p̥-	*p	p	*f	*p, *p̥	*p	*p	*h > *∅	*φ	*p	*p
*-p̥-	*p	p	*f	*p, *p̥	*p	*p	*pp	*p, *b	*b	*pp
*d-	*d	d	*d	*d	*d <sup>h</sup>	*t	*j	*d, _i/*ǰ	*d	*t
*-d-	*d	d	*d	*d	*d <sup>h</sup>	*δ	*δ	*d	*d	t̥/t̥
*t-	*t	t	*t	*t	*d	*t	*t ·	*d, _i/*ǰ	*d	*t
*-t-	*t	t	*t	*t	*d	*t	*t	*d	*d	*t̥
*t̥-	*t̥, *t	d	*d̥	*t̥	*t	*t	*t̥	*t, _i/*ć	*t	*t
*-t̥-	*t̥, *t	d, t	*d̥, *t̥	*t̥	*t	*tt	*t̥	*t	*t	*tt/t
*g-	*g	g, ʒ	*g	*g	*g <sup>h</sup> , *g̃ <sup>h</sup> , *g <sup>wh</sup>	*k	*k ·	*g, *g	*g	*k
*-g-	*g	g, ʒ	*g	*g	*g <sup>h</sup> , *g̃ <sup>h</sup> , *g <sup>wh</sup>	*γ	*g	*g, *g, *γ, *γ	*g	*k
*k-	*k	k, c	*k, *g?	*k	*g, *g̃, *g <sup>w</sup>	*k	*k ·	*k, *q	*k	*k
*-k-	*k	k, c		*k	*g, *g̃, *g <sup>w</sup>	*k	*g, *k	*g, *g, *γ, *γ	*g	*k
*k̥-	*k̥, *k	q	*γ, *k	*k̥	*k, *k̃, *k <sup>w</sup>	*k	*k̥, *k ·	*k, *q	*x	*k
*-k̥-	*k̥	ʔ		*γ	*x, *x <sup>w</sup> , [*xʔ]	*∅	*∅	*∅	*∅, ?*g	*∅

Table2: Detailed Nostratic sound correspondences for stops according to Dolgopolsky

On the basis of these sound correspondences, Dolgopolsky (2008:8) reconstructs the following consonant system for Proto-Nostratic:

b	p	p̥			w	m		
d	t	t̥				n	l	
ʒ	c	ç	z	s				
ǰ	č	č̥	ž	š		ɳ (= ɳ)	l	r
ǰ	ć	ć̥	ź	ś	y	ń	í	ř
ǰ	ĉ	ĉ̥	ž	š				
g	k	k̥				ŋ		
g	q	q̥	ɣ	χ				
				ħ (= ħ)	ʕ			
	ʔ			h				

Symbols: ʒ = dʒ; c = tʃ; ʒ̣ = dʒ̣; č = tʃ̣; lateral obstruents ẓ̌, č̣, ẓ̣̌, č̣̣ = lateralized ʒ, c, ʒ, s; palatalized consonants ẓ̣̌, č̣̣, ẓ̣̣̌, č̣̣̣, ẓ̣̣̣̌, č̣̣̣̣ = palatalized ʒ, c, ʒ, s, n, l, r; ʎ and ɳ (= ɳ) = cacuminal or retroflex l and n; uvular stops: q (voiced), q̣ (voiceless), q̣̣ (“emphatic”); uvular fricatives: χ = Spanish j, χ = Arabic ħ /ǧ/; epiglottal (pharyngeal) consonants: voiceless ħ (= ħ = Arabic ح), voiced ʕ (= Arabic ع).

The system of vowels reconstructed by Dolgopolsky is identical to that previously reconstructed for Proto-Nostratic by Illič-Svityč:

i		u ü
	e	o
	a ä	

### 7. Remarks on the Proto-Nostratic vowel system

According to Bomhard, the following vowels may be reconstructed for Proto-Nostratic: *\*a*, *\*e*, *\*i*, *\*o*, and *\*u*. At least some of these vowels must have been subject to considerable subphonemic variation in the Nostratic parent language. The high front and back vowels *\*i* and *\*u*, in particular, may be assumed to have had lowered variants (indicated in the Proto-Nostratic reconstructions as *\*e* and *\*o* respectively), while the central low vowel *\*a* may be assumed to have had higher variants (indicated in the Proto-Nostratic reconstructions as *\*ə*). To complicate matters, *\*e* and *\*o* must also have existed as independent vocalic elements. It was the reanalysis, phonemicization, and exploitation of this subphonemic variation that gave rise to the ablaut and vowel harmony patterning found in the majority of the Nostratic daughter languages. It may be noted here that, according to Greenberg (1990), traces of an earlier system of vowel harmony can be discerned in Proto-Indo-European.

It is unclear whether phonemic long vowels existed in Proto-Nostratic as well, though the evidence seems to indicate that they did not, except in nursery words.

Finally, it may be noted that, while any vowel (*\*a*, *\*e*, *\*i*, *\*o*, *\*u*) could appear in initial syllables, only *\*a*, *\*i*, *\*u* could appear in non-initial syllables. This is identical to the patterning found in Dravidian.

### 8. Remarks on the Proto-Nostratic consonant system

The Nostratic sound correspondences given in the tables in the Appendix to this chapter are based exclusively upon the work of Bomhard. As noted above, they differ in several significant respects from the sound correspondences proposed by the Moscow School, as represented in the work of Illič-Svityč and Dolgopolsky. Bomhard bases his views on three fundamental assumptions:

1. The traditional reconstruction of the Proto-Indo-European consonant system is flawed and is to be reinterpreted along the lines proposed, on the one hand, by Thomas V. Gamkrelidze and Vjačeslav V. Ivanov and, on the other hand, by Paul J. Hopper, as follows (the reconstruction of the Proto-Indo-European stop system posited by Lehmann [1952:99] is given for comparison):

Lehmann				Gamkrelidze—Ivanov		
b	b <sup>h</sup>	p	=	p'	bh/b	ph/p
d	d <sup>h</sup>	t	=	t'	dh/d	th/t
g	g <sup>h</sup>	k	=	k'	gh/g	kh/k
g <sup>w</sup>	g <sup>wh</sup>	k <sup>w</sup>	=	k' <sup>w</sup>	g <sup>wh</sup> /g <sup>w</sup>	k <sup>wh</sup> /k <sup>w</sup>

2. The frequency distribution of Proto-Nostratic stops (and affricates) in the reconstruction proposed by Illič-Svityč and Dolgopolsky is in contradiction to typological predictions, and is, therefore, highly suspect (see below).
3. Taking into consideration (1) the radical reinterpretation of the Proto-Indo-European consonant system proposed by Gamkrelidze, Ivanov, and Hopper, as well as (2) the problems in the frequency distribution of stops (and affricates) in the reconstruction of the Proto-Nostratic phonological system proposed by Illič-Svityč and Dolgopolsky, a different set of Nostratic sound correspondences is warranted.

Each of these assumptions must be evaluated independently. The reasons that each of these assumptions must be evaluated independently are as follows: Even if assumption 1 proves to be untenable, it does not invalidate assumption 2. Likewise, even if assumption 2 proves to be untenable, it does not invalidate assumption 1. Assumption 3, on the other hand, is dependent upon assumption 2 but not assumption 1. That is to say, assumption 3 is not dependent upon any particular reconstruction of the Proto-Indo-European consonant system, though, it goes without saying, if assumption 1 is valid, it reinforces the likelihood that the revised set of Nostratic sound correspondences that Bomhard has proposed is correct. Inasmuch as assumption 3 is dependent on assumption 2, however, if assumption 2 is invalid, then assumption 3 is unnecessary. Moreover, even if assumption 2 is valid and a different set of Nostratic sound correspondences is warranted, it does not necessarily follow that the alternative correspondences that Bomhard has proposed are the only possible scenario, though other scenarios are considerably less likely.

Let us now consider the basis for assumption 2: The mistake that Illič-Svityč and Dolgopolsky made was in trying to equate the glottalized stops of Proto-Kartvelian and Proto-Afrasian with the traditional plain voiceless stops of Proto-Indo-European. Their reconstruction would make the glottalized stops the least marked members in the Proto-Nostratic labial series and the most marked in the velar series. Such a reconstruction is thus in contradiction to typological evidence, according to which glottalized stops uniformly have the opposite frequency distribution (most marked in the labial series and least marked in the velar series). The reason that Illič-Svityč's and Dolgopolsky's reconstruction contradicts the typological evidence is as follows: Illič-Svityč and Dolgopolsky posit glottalics for Proto-Nostratic on the basis of a small number of seemingly solid examples in which glottalics in Proto-Afrasian and/or Proto-Kartvelian appear to correspond to traditional plain voiceless stops in Proto-Indo-European. On the basis of these examples, they assume that, whenever there is a voiceless stop in the Proto-Indo-European examples they cite, a glottalic is to be reconstructed for Proto-Nostratic, even when there are no glottalics in the corresponding Kartvelian and Afrasian forms! This means that the Proto-Nostratic glottalics have the same frequency distribution as the Proto-Indo-European plain voiceless stops. Clearly, this cannot be correct (Alexis Manaster Ramer 1997 makes the same observation). The main consequence of the mistaken comparison of the glottalized stops of Proto-Kartvelian and Proto-Afrasian with the traditional plain voiceless stops of Proto-Indo-European is that Illič-Svityč and Dolgopolsky are led to posit forms for Proto-Nostratic on the basis of theoretical considerations but for which there is absolutely no evidence in any of the Nostratic daughter languages.

The question then arises: Do these criticisms completely invalidate the cognate sets involving glottalized stops (and affricates) proposed by Illič-Svityč and Dolgopolsky? Well, no, not exactly — it is not quite that simple. In many cases, the etymologies are correct, but the Proto-Nostratic reconstructions are wrong — here, a simple rewriting of the reconstructions is all that is required. Other examples adduced by Illič-Svityč and Dolgopolsky admit alternative explanations, while still others are questionable from a semantic point of view and should be abandoned. Once the questionable examples are removed, there is an extremely small number left over (no more than a handful) that appear to support their position. However, compared to the massive counter-evidence supplied by Bomhard (2008, volume 2), even these remaining examples become suspect (they may be borrowings or simply false cognates). Finally, there are even some examples where the comparison of glottalized stops in Proto-Kartvelian and Proto-Afrasian with plain voiceless stops in Proto-Indo-

European is correct. This occurs in the cases where two glottalics originally appeared in a Proto-Nostratic root: \*C'VC'-. Such roots are preserved without change in Proto-Kartvelian and Proto-Afrasian, while in Proto-Indo-European, they have been subject to a rule of regressive deglottalization: \*C'VC' -> \*CVC'-.

We may close this section by noting that Campbell—Poser (2008:243—264) have recently prepared a highly critical and devastating assessment of the work on Nostratic by the Moscow School in general and by Illič-Svityč in particular.

#### 9. *Root patterning in Bomhard's approach*

Comparison of the various Nostratic daughter languages makes it possible to determine the rules governing the structural patterning of roots and stems in Proto-Nostratic. Most likely, the earliest patterning was as follows (cf. Bomhard 2008.1:215—216 and 1:391—394):

1. There were no initial vowels in Proto-Nostratic. Therefore, every root began with a consonant.
2. Originally, there were no initial consonant clusters either. Consequently, every root began with one and only one consonant. Medial clusters were permitted, however.
3. Two basic root types existed: (A) \*CV and (B) \*CVC, where C = any non-syllabic, and V = any vowel. Permissible root forms coincided exactly with these two syllable types.
4. A stem could either be identical with a root or it could consist of a root plus a single derivational morpheme added as a suffix to the root: \*CVC+CV-. Any consonant could serve as a suffix.
5. A stem could thus assume any one of the following shapes: (A) \*CV-, (B) \*CVC-, (C) \*CVC+CV-, or (D) \*CVC-CVC-. As in Proto-Altaiic, the undifferentiated stems were real words in themselves and could be used without additional suffixes or grammatical endings. However, when so used, a vowel had to be added to the stem (unless the stem already ended in a vowel or in a semivowel, nasal, or liquid), thus: (A) \*CV- > \*CV (no change), (B) \*CVC- > \*CVC+V, (C) \*CVC-CV- > (no change), or (D) \*CVC-CVC- > \*CVC-CVC+V. Following Afrasian terminology, this vowel may be called a “terminal vowel” (TV). Not only did terminal vowels exist in Proto-Afrasian, they were also found in Dravidian, where they are called “enunciative vowels”. As in Proto-Dravidian, the terminal vowel was only required in stems ending in obstruents, which could not occur in final position.

The original root structure patterning was maintained longer in Proto-Dravidian and Proto-Altaiic than in the other branches, while the patterning found Proto-Indo-European, Proto-Kartvelian, and Proto-Afrasian is based upon slightly later developments. The root structure constraints found in Proto-Indo-European were an innovation. In Proto-Uralic, the rule requiring that all words end in a vowel was an innovation and arose from the incorporation of the so-called “terminal vowel” into the stem. It should be mentioned that reduplication was a widespread phenomenon.

On the basis of the evidence of Proto-Indo-European, Proto-Kartvelian, Proto-Afrasian, Proto-Dravidian, and Proto-Altaiic, it may be assumed that there were three fundamental stem types: (A) verbal stems, (B) nominal and adjectival stems, and (C) pronominal and indeclinable stems. Some stems were exclusively nominal. In the majority of cases, however, both verbal stems and nominal stems could be built from the same root. In Proto-Nostratic, only pronominal and indeclinable stems could end in a vowel. Verbal and nominal stems, on the other hand, had to end in a consonant, though, as noted above, when the undifferentiated stems were used as real words in themselves, a “terminal vowel” had to be added to the stem (but only when the stem ended in an obstruent). The terminal vowels were morphologically significant. Adjectives did not exist as an independent grammatical category in Proto-Nostratic.

During the earliest period of Proto-Nostratic, roots could only have the forms: (A) \*CV and (B) \*CVC. Type (A) was restricted to pronominal stems and indeclinables, while type (B) characterized nominal and verbal stems. A single derivational formative could be placed after root type (B): \*CVC + CV (derivational formative). Grammatical relationships were indicated by placing particles either after the undifferentiated stem or after the stem plus a derivational formative: (A) \*CVC + CV (particle [P]) or (B) \*CVC + CV (derivational formative [DF]) + CV (particle [P]). In this scheme, a morphologically significant *formative vowel* (FV) had to be added either directly after the root if it ended in a consonant or between the root and any following element, be it particle or derivational formative; thus, we get the following patterns:

- (A) \*CVC + V<sub>FV</sub> (plus particle: \*CVC + V<sub>FV</sub> + CV<sub>P</sub>)  
 (B) \*CVC + V<sub>FV</sub> + CV<sub>DF</sub> (plus particle: \*CVC + V<sub>FV</sub> + CV<sub>DF</sub> + CV<sub>P</sub>)  
 (C) \*CVC-CVC + V<sub>FV</sub> (plus particle: \*CVC-CVC + V<sub>FV</sub> + CV<sub>P</sub>)

Eventually, the vowel of the derivational formative after the stem plus formative vowel was lost in type (B) when a particle was added, as follows: \*CVC + V<sub>FV</sub> + C<sub>DF</sub> + CV<sub>P</sub>. This is essentially the stage represented in Proto-Dravidian, though Proto-Dravidian has added long vowels to the equation as well as stems beginning with a vowel (no doubt arising from the loss of initial laryngeals). Next, the formative vowel was reinterpreted as part of the derivational formative in type (B): \*CVC + VC + CV. This is the stage represented by Proto-Afrasian and is the basis for the root structure patterning found in Proto-Kartvelian and Proto-Indo-European as well. From an Afrasian perspective, there is no such thing as “formative vowels” — they are only preserved in Dravidian and Elamite, though, in Elamite, their status is disputed.

#### 10. Proto-Nostratic morphology and syntax in Bomhard's approach

The assumptions we make about the morphological and syntactical structure of a given proto-language profoundly affect the reconstructions that we propose. In what follows, we will be discussing Bomhard's proposal (2008.1:387—391) that Proto-Nostratic may have been an active language. Now, active languages exhibit specific characteristics that set them apart from other morphological types. Therefore, the reconstructions given below will conform with an active structure. However, it must be stressed that reconstructions should never be driven by theory alone. Rather, they must be fully consistent with the supporting data. Moreover, not only must our reconstructions be consistent with the supporting data, they must be consistent from a typological perspective as well, and they must be able to account for later developments in the descendant languages in as straightforward a manner as possible, without recourse to ad hoc rules. When reconstructions are driven by theory alone, the results can be disastrous.

Several scholars have recently presented persuasive arguments in favor of reconstructing an early phase of Proto-Indo-European as an active language. Proto-Afrasian is also assumed to have been an active language. In active languages, subjects of both transitive and intransitive verbs, when they are agents semantically, are treated identically for grammatical purposes, while non-agent subjects and direct objects are treated differently. An “agent” may be defined as the entity responsible for a particular action or the entity perceived to be the cause of an action.

Above, we mentioned that Proto-Nostratic had *formative vowels*. Now, it is curious that the formative vowel can take different shapes in Proto-Dravidian: \*a, \*i, or \*u. This seems to indicate that the different formative vowels must have had some sort of morphological significance at one point in time, even though this distinction has been lost in Dravidian. Not only must the formative vowels have had morphological significance, it is even probable that they had different significance depending upon whether a nominal or verbal stem was involved.

For verbal stems, the formative vowels may have been aspect markers, as follows: \*a marked imperfective, \*i marked perfective, and \*u marked subordinate.

For nominal stems, the situation is a bit more complicated. The following patterning may be reconstructed for the earliest period of development in Proto-Nostratic: *\*-i/\*-u* was used to mark the subject in active constructions, while *\*-a* was used to mark the direct object in active constructions as well as the subject in stative constructions. *\*-a* was also used to mark the so-called “*status indeterminatus*”.

In later Proto-Nostratic, this patterning became disrupted, though it may have survived into Proto-Afrasian. In later Proto-Nostratic, the relational markers *\*-ma* and *\*-na* came to be used to mark the direct object in active constructions as well as the subject in stative constructions. Eventually, these relational markers became the primary means of marking the direct object in active constructions or the subject in stative constructions, with the result that the older patterning became disrupted. Thus, in the latest stage of the Nostratic parent language, we find the following patterning:

1. *\*-i/\*-u*: used to mark the subject in active constructions:

(A) *\*CVC + i/u*

(B) *\*CVC + i/u + CV<sub>DF</sub>*

(C) *\*CVC-CVC + i/u*

2. *\*-a ~ \*-ma/\*-na*: used to mark the direct object in active constructions as well as the subject in stative constructions:

(A) *\*CVC + a* plus *\*-ma/\*-na: \*CVC + a + ma/na*

(B) *\*CVC + a + CV<sub>DF</sub>* plus *\*-ma/\*-na: \*CVC + a + C(V)<sub>DF</sub> + ma/na*

(C) *\*CVC-CVC + a* plus *\*-ma/\*-na: \*CVC-CVC + a + ma/na*

*\*-ma/\*-na* was the first case form (bound relational marker) to develop in Proto-Nostratic. The second was the genitive (in the sense ‘belonging to’) in *\*-nu*. Indeed, these are the only two bound relational markers that can be confidently reconstructed for the latest period of Proto-Nostratic. Finally, it seems likely that unextended *\*-a* remained as the indicator of the *status indeterminatus*.

Proto-Nostratic syntax was head-final, or left-branching, that is, dependents preceded their heads according to the so-called “rectum-regens rule”. In other words, “adverbs” preceded verbs, “adjectives” preceded nouns, and auxiliaries followed the main verb, though it must be emphasized here that adjectives did not exist as an independent grammatical category in Proto-Nostratic. The unmarked syntactical order was Subject + Object + Verb (SOV).

## 11. Reconstructed pronominal, deictic and anaphoric stems

### 11.1. First Person Stems

First person singular (active): *\*mi*

First person plural (inclusive, active): *\*ma*

First person (stative): *\*k<sup>w</sup>a*

First person (stative): *\*Ha*

First person singular: *\*na*

First person plural (exclusive, active): *\*na*

First person (postnominal possessive/preverbal agentive): *\*<sup>2</sup>iya*

### 11.2. Second Person Stems

Second person (active): *\*t<sup>h</sup>i (~ \*t<sup>h</sup>a)*

Second person: \**si*  
 Second person: \**ni*

### 11.3. Anaphoric and Deictic Stems

Pronominal base of unclear deictic function: \**-gi/\*-ge*  
 Deictic particle: (A) \**ʔa-/\*ʔə-* (distant), (B) \**ʔi-/\*ʔe-* (proximate), and (C) \**ʔu-/\*ʔo-* (intermediate)  
 Deictic particle: (A) \**k<sup>h</sup>a-/\*k<sup>h</sup>ə-* (proximate), (B) \**k<sup>h</sup>u-/\*k<sup>h</sup>o-* (distant), and (C) \**k<sup>h</sup>i-/\*k<sup>h</sup>e-* (intermediate)  
 Deictic particle: (A) \**t<sup>h</sup>a-/\*t<sup>h</sup>ə-* (proximate), (B) \**t<sup>h</sup>u-/\*t<sup>h</sup>o-* (distant), and (C) \**t<sup>h</sup>i-/\*t<sup>h</sup>e-* (intermediate)  
 Deictic particle: \**ša-/\*šə-*  
 Anaphoric pronoun stem: \**si-/\*se-*  
 Anaphoric pronoun stem: \**na-*, \**ni-*  
 Deictic particle: \**t<sup>yh</sup>a-* ‘that over there, that yonder (not very far)’

### 11.4. Interrogative, Relative, and Indefinite Stems

Relative: \**k<sup>wh</sup>i-/\*k<sup>wh</sup>e-*; interrogative: \**k<sup>wh</sup>a-/\*k<sup>wh</sup>ə-*  
 Interrogative-relative stem: \**ʔay-*, \**ʔya-*  
 Interrogative: \**mi-*; relative: \**ma-*  
 Interrogative-relative: \**na*  
 Indefinite: \**ma-*, \**mi-*, \**mu-*  
 Indefinite: \**d<sup>i</sup>i-/\*d<sup>i</sup>e-* ‘this one, that one’

## 12. Proto-Nostratic nominal morphology

The overall structure of nominals (nouns and adjectives) was as follows:

Root + formative vowel (+ derivational suffix)  
 (+ relational marker) (+ number marker)

A stem could consist of the unextended root or the root extended by a single derivational suffix (preceded, as indicated above, by a formative vowel). As has already been noted, it is necessary to recognize two distinct periods of development in Proto-Nostratic. In the earliest phase of development, the relational markers listed below were free relational morphemes (postpositional particles). In later Proto-Nostratic, however, at least two of them were well on their way to becoming bound relational morphemes (case suffixes).

As already noted, only the following two bound relational markers (case suffixes) can be confidently reconstructed for the latest period of Proto-Nostratic: (A) direct object \**-ma*, \**-na* and (B) genitive \**-nu*. Other case relationships were expressed by postpositions (see below for a list), some of which developed into bound case morphemes in the individual daughter languages. This is confirmed by Dravidian, where only the accusative (\**-ay*, \**-Vn*), dative (\**-kk-/\*-k-*), and genitive (\**-a*, \**-in*) can be confidently reconstructed for the Dravidian parent language. Other case forms developed within the Dravidian daughter languages. Likewise, only the following two grammatical cases can be reconstructed for Proto-Uralic: (A) accusative \**-m*, which probably was used to mark the definite direct object of finite verbs, and (B) a subordinate suffix \**-n*, which functioned as a genitive/nominalizer with nouns and as an adverb formant with verbs. There were also at least three local cases in Proto-Uralic: (A) locative \**-nA*, (B) separative \**-tA* ~ \**-tI*, and (C) and perhaps the latives \**-k* (and/or \**-ŋ*) and \**-t<sup>y</sup>* (traditional \**-ć*) (and/or \**-n<sup>y</sup>* [traditional \**-ń*]). Denis Sinor (1988:714—725) has devoted an important study to the question of common case markers between Uralic and Altaic. He, too, posits a Proto-Uralic accusative in \**-m* and a genitive in \**-n*. For the former, he notes that nothing comparable can be posited for Proto-Turkic or Proto-Mongolian, but he

does reconstruct a Proto-Tungus accusative *\*-m*, which is in agreement with what is found in Uralic. The clearest parallels for the latter are to be found in the Proto-Mongolian genitive *\*-n* and in the Proto-Turkic genitive *\*-n*. The genitive and accusative have converged in some Mongolian languages. This seems to indicate that Proto-Mongolian may have preserved the *\*-n* variant accusative form as opposed to the *\*-m* variant found in Uralic and Tungus. Sinor (1988:715—725) also discusses the Uralic and Altaic parallels between various local cases. Finally, it is worth mentioning here that, within Afrasian, Zaborski (1990:628) tentatively reconstructs the following case morphemes for Proto-Omotic: (A) nominative *\*-i*, (B) genitive-instrumental-directional *\*-kV*, (C) dative *\*-s*, (D) dative-comitative *\*-rV*, (E) accusative *\*-a* and *\*-nV*, (F) instrumental-locative-directional-dative *\*-nV*, and (G) ablative *\*-pV*. Zaborski (1990:618) notes that some of these case forms may go back to earlier postpositions. Parallels with Cushitic show that at least some of these case forms go back to Proto-Afrasian. Diakonoff (1988:61) notes that the following cases can be established for Proto-Afrasian with reasonable certainty: (A) *\*-Vš*, *\*-šV* locative-terminative; (B) *\*-dV*, *\*-Vd* comitative, dative; (C) *\*-kV* ablative and comparative; (D) *\*-Vm* locative-adverbialis; (E) *\*-l* directive; and (F) *\*-p* (also *\*-f*) ablative (in Omotic); conjunction, demonstrative pronoun in other languages. The ultimate Nostratic origin of several of the case forms posited by Zaborski for Proto-Omotic and by Diakonoff for Proto-Afrasian is completely transparent. In Proto-Nostratic, adjectives did not exist as a separate grammatical category. They were differentiated from nouns mainly by syntactical means — “adjectives” preceded the nouns they modified. Moreover, they did not agree with the head noun in number or gender.

#### 12.1. *Reconstructed relational markers*

Direct object: *\*-ma*

Direct object: *\*-na*

Possessive: *\*-nu* ‘belonging to’

Possessive: *\*-IV* ‘belonging to’

Dative: *\*-na* ‘to, for’

Directive: *\*-k<sup>h</sup>a* ‘direction to or towards, motion to or towards’

Directive(-locative): *\*-ri* ‘direction to or towards, motion to or towards’ (?)

Locative: *\*-ni* ‘the place in, on, or at which something exists or occurs’

Locative, instrumental-comitative: *\*-ma* ‘in, from, with’

Locative: *\*-bi* ‘in addition to, together with’

Locative: *\*-i* ‘near to, near by’ (?)

Comitative-locative: *\*-da* ‘together with’

Oblique: *\*-t<sup>h</sup>a*

#### 12.2. *Reconstructed dual and plural markers*

Dual: *\*k<sup>h</sup>i(-nV)*

Plural: *\*-t<sup>h</sup>a*

Plural: *\*-ri*

Plural: *\*-k<sup>h</sup>u*

Plural (Eurasian only): *\*-sV*

Plural/collective: *\*-la*

Plural: *\*-nV*

Note: plurality could also be expressed by reduplication of the root.

#### 12.3. *Reconstructed derivational suffixes*

Nominalizer: *\*-ri/\*-re*

Nominalizer: *\*-ma*

Nominalizer: *\*-ya*

Nominalizer: *\*-t<sup>h</sup>a*

Nominalizer: *\*-na*  
 Nominalizer: *\*-la*  
 Nominalizer: *\*-k<sup>h</sup>a*  
 Nominalizer: *\*-k'a*

### 13. Proto-Nostratic Verbal morphology

In Proto-Nostratic, verbs fell into two types of construction: (1) active and (2) stative. In active constructions, which usually involved transitive verbs, the grammatical subject of the verb represented the agent performing the action, and the direct object represented the patient, or recipient, of the action. Stative constructions, on the other hand, expressed a state of affairs, rather than an event. Verbs expressed aspectual contrasts rather than temporal contrasts. Tense relates the time of the situation referred to to some other time, usually to the moment of speaking, while aspect marks the duration or type of temporal activity denoted by the verb. Proto-Nostratic had two aspects: (A) perfective (past) and (B) imperfective (non-past). Proto-Nostratic also had, at the very least, the following moods: (A) indicative; (B) imperative; (C) conditional; (D) hortatory-precative; (E) inchoative; and (F) prohibitive. There was also a causative construction.

The overall structure of verbs was as follows:

Root + formative vowel (+ derivational suffix)  
 (+ mood marker) (+ person marker) (+ number marker)

A stem could consist of the unextended root or the root extended by a single derivational suffix (preceded, as indicated above, by a formative vowel). The position of the number marker seems to have been flexible — it could also be placed before the person marker. Gender was not marked. There were no prefixes in Proto-Nostratic. We may note here that Krishnamurti (2003:279 and 312) posits the following structure for verbs in Proto-Dravidian:

Stem + tense-mood + (gender-)number-person marker

Stative verbs were indifferent to number and, therefore, had no plural forms. They also had a special set of person markers different from those of active verbs:

Person	Active person markers		Stative person markers
	Singular	Plural	
P1	<i>*mi</i>	<i>*ma</i> (inclusive) (+ plural marker)	<i>*k<sup>h</sup>a</i>
	<i>*na</i>	<i>*na</i> (exclusive) (+ plural marker)	<i>*Ha</i>
P2	<i>*t<sup>h</sup>i</i>	<i>*t<sup>h</sup>i</i> (+ plural marker)	<i>*t<sup>h</sup>i</i>
	<i>*si</i>		
	<i>*ni</i>		
P3	<i>*ša-/*šə-</i>	<i>*ša-/*šə-</i> (+ plural marker)	<i>*∅</i>
	<i>*na-, *ni-</i>	<i>*na-, *ni-</i> (+ plural marker)	

Table4: Proto-Nostratic reconstructed pronouns

Morphologically, verbs could be either finite or non-finite. Finite forms could be marked for aspect, mood, person, and number, but not for gender or tense. Non-finite forms exhibited nominal inflection. In unmarked word order, the verb occupied the end position of a clause.

13.1. *Non-finite verb suffixes*

The following non-finite verb forms are widespread enough in the Nostratic daughter languages to guarantee their common origin, and, consequently, they are listed separately here. However, at the Proto-Nostratic level, they were indistinguishable from the nominalizing suffixes listed above.

Participle: *\*-na*

Participle: *\*-t<sup>h</sup>a*

Gerundive-participle: *\*-la*

13.2. *Finite verb suffixes: mood markers*

Imperative: *\*-k<sup>h</sup>a*, *\*-k<sup>h</sup>i*, *\*-k<sup>h</sup>u*

Conditional: *\*-ba*

Hortatory-precative: *\*-li*

Inchoative: *\*-na*

Note: the bare stem could also serve as imperative.

13.3. *Finite verb suffixes: others*

Causative: *\*-sV*

14. *Illič-Svityč's and Dolgopolsky's Views on Proto-Nostratic Morphology*

Illič-Svityč never published his views on Nostratic morphology during his lifetime. However, his notes were gathered together and published by Vladimir Dybo in 2004 in the proceedings of the Pécs Centennial Conference, edited by Irén Hegedűs and Paul Sidwell. According to Illič-Svityč, Proto-Nostratic was an inflected language, apparently of the accusative type. It had both nouns and adjectives. Nominal declension was only available in the singular. Adjectives were declined only if they were substantivized and used independently. Illič-Svityč reconstructs the nominal paradigm as follows:

1. Nominative-accusative: *\*-∅* (zero); used for subject and unmarked object;
2. Marked object: *\*-m<sub>A</sub>*; used if the object had to be topicalized in the sentence if the possibility existed for an ambiguous interpretation of the phrase and if a definite object was indicated;
3. Genitive (connective): *\*-n*; possessive, etc.;
4. Instrumental: *\*-t<sub>A</sub>*
5. Local cases: Lative: *\*-k<sub>A</sub>*; Ablative: *\*-da*; Essive (locative): *\*-n*.

Plurality was primarily indicated by a special marker: *\*-t*. Illič-Svityč also reconstructs an oblique plural marker *\*-j*, though he notes that this is less certain. Illič-Svityč reconstructs the following types of personal pronouns:

1. Independent pronouns — specifically for indicating the pronominal subject;
2. Forms of the subject standing by a verb, primarily in a position preceding a noun;
3. Forms of the direct object of a verb, primarily in a position preceding a noun after the form of the subject;
4. Possessive forms next to nouns, primarily in a position after a noun.

Only the first and second person singular and plural pronouns were represented in these four types. Illič-Svityč reconstructs the following stems for these types:

1. Independent pronouns; these stems could be extended by a facultative emphatic element *\*-na*:

1st person singular: *\*<sub>A</sub>ke-na*

2nd person singular: \**tA-na*  
 1st person plural: \**naHe-na*  
 2nd person plural: ?

2. Forms of the subject of verbs:

1st singular: \**a-*  
 2nd singular: \**ta-*  
 1st plural: \**na-*  
 2nd plural: ?

3. Forms of the direct object:

1st singular: \**mi-*;  
 2nd singular: \**k-*;  
 1st plural: ?  
 2nd plural: ?

4. Possessive forms:

1st singular: \**mi-*  
 2nd singular: \**si-*  
 1st plural: \**mAN*  
 2nd plural: \**sAN*

Illič-Svityč also posits the following demonstrative stems (fulfilling the function of 3rd person pronouns): \**ta-*, \**šä-*, \**mu-*; the following interrogative stems: \**ko* ‘who?’, \**mi* ‘what?’; and the following interrogative-relative stems: \**ja*, \**na* (?).

Illič-Svityč’s views on verb morphology were not as well developed. He reconstructs an imperative as well as the following two opposing verb categories: (1) The first designated the action itself (transferred to the object in the case of transitive verbs). This was used with the subject pronoun and (in the case of transitive verbs) with the object pronoun. Here, the nominal direct object was the marked form, and the verb stem coincided with the infinitive. (2) The other verb form was a derived noun ending in \**-a*. It indicated the state of the subject. If the verb were transitive, it contained only the prefix of the subject, and, in this case, the object noun could not be marked and thus always appeared in the subjective-objective case. Finally, Illič-Svityč suggests that there existed a temporal (or aspectual) distinction between these two basic verb categories, which was probably realized with the help of deictic particles of pronominal origin.

Dolgopolsky’s views on Proto-Nostratic morphology differ from those of Illič-Svityč. According to Dolgopolsky, Proto-Nostratic was a highly analytic language. Dolgopolsky notes that Illič-Svityč, although recognizing the analytical status of many grammatical elements in Proto-Nostratic, still believed that some of them were agglutinated suffixes, specifically, the marker of oblique cases \**-n* (= Dolgopolsky’s \**nu* ‘of, from’), the formative of marked accusative \**-m[ʌ]* (= Dolgopolsky’s \**mA*), the plural marker \**-NA* (= Dolgopolsky’s \**n[ä]*, used to mark collectivity and plurality), and several others. Dolgopolsky points out that Illič-Svityč’s position is unacceptable inasmuch as the Proto-Nostratic formants in question still preserve the following traces of their former analytic status: (1) mobility within a sentence (a feature of separate words rather than suffixes); (2) the fact that several particles are still analytic in some of the Nostratic descendant languages; and (3) the fact that Proto-Nostratic etyma with grammatical and derivational function are sometimes identical with “autosemantic words”.

Though Bomhard mostly agrees with Dolgopolsky that Proto-Nostratic was originally an analytic language, he maintains that, in its latest stage of development, several of the particles were beginning to develop into bound relational markers.

Bomhard devotes two chapters in his 2008 book to Proto-Nostratic morphology. In the first chapter (Chapter 16), he presents the evidence, while, in the following chapter (Chapter 17), he attempts a systematic reconstruction of Proto-Nostratic morphology.

15. *Prohibitive/negative particles and indeclinables*

Bomhard (2008.1:368—373, 1:383—386, 1:415) reconstructs the following negative/prohibitive particles and indeclinables for Proto-Nostratic:

- Negative particles: *\*na*, *\*ni*, *\*nu*
- Prohibitive particle: *\*ma*(?)
- Negative particle: *\*ʔal-* (~ *\*ʔəl-*)
- Negative particle: *\*li* (~ *\*le*) (?)
- Negative particle: *\*ʔe*
- Post-positional intensifying and conjoining particle: *\*k<sup>wh</sup>a-* (~ *\*k<sup>wh</sup>ə-*)
- Particle: *\*k<sup>wh</sup>ay-* ‘when, as, though, also’
- Particle: *\*har<sup>y</sup>-* ‘or; with, and; then, therefore’
- Particle: *\*ʔin-* (~ *\*ʔen-*), *\*(-)ni* ‘in, into, towards, besides, moreover’
- Sentence particle: *\*wa* (~ *\*wə*) ‘and, also, but; like, as’
- Coordinating conjunction: *\*ʔaw-*, *\*ʔwa-* (~ *\*ʔwə-*) ‘or’

Note: The CVC- root structure patterning of some of these forms points to their ultimate nominal or verbal origin. For example, the negative particle *\*ʔal-* (~ *\*ʔəl-*) must ultimately have been a negative verb stem meaning ‘to be not so-and-so’, as in its Dravidian derivatives, while *\*ʔin-* (~ *\*ʔen-*), *\*(-)ni* was originally a nominal stem meaning ‘place, location’.

Appendix 1: *Nostratic Sound Correspondences According to Bomhard*

Proto-Nostratic	Proto-IE	Proto-Kartvelian	Proto-Afrasian	Proto-Uralic	Proto-Dravidian	Proto-Altaic	Proto-Eskimo
b-	b <sup>h</sup> -	b-	b-	p-	p-	b-	p-
-b-	-b <sup>h</sup> -	-b-	-b-	-w-	-pp-/-vv-	-b-	-v-
p <sup>h</sup> -	p <sup>h</sup> -	p-	p-, f-	p-	p-	p <sup>h</sup> -	p-
-p <sup>h</sup> -	-p <sup>h</sup> -	-p-	-p-, -f-	-p-	-pp-/-v-	-p <sup>h</sup> -	-p(p)-
p'-	(p'-)	p'-	p'-			p-	
-p'-	(-p'-)	-p'-	-p'-			-p-	

Proto-Nostratic	Proto-IE	Proto-Kartvelian	Proto-Afrasian	Proto-Uralic	Proto-Dravidian	Proto-Altaic	Proto-Eskimo
d-	d <sup>h</sup> -	d-	d-	t-	t-	d-	t-
-d-	-d <sup>h</sup> -	-d-	-d-	-t-	-t(t)-	-d-	-ð-
t <sup>h</sup> -	t <sup>h</sup> -	t-	t-	t-	t-	t <sup>h</sup> -	t-
-t <sup>h</sup> -	-t <sup>h</sup> -	-t-	-t-	-t(t)-	-tt-	-t <sup>h</sup> -	-t(t)-
t'-	t'-	t'-	t'-	t-	t-	t-	t-
-t'-	-t'-	-t'-	-t'-	-t-	-t(t)-	-t-	-t-

Proto-Nostratic	Proto-IE	Proto-Kartvelian	Proto-Afrasian	Proto-Uralic	Proto-Dravidian	Proto-Altaic	Proto-Eskimo
m-	m-	m-	m-	m-	m-	m-	m-
-m-	-m-	-m-	-m-	-m-	-m-	-m-	-m-
n-	n-	n-	n-	n-	n-	n-	n-
-n-	-n-	-n-	-n-	-n-	-n-/- <u>n</u> -	-n-	-n-
n <sup>y</sup> -	n-		n-	n <sup>y</sup> -	ñ-	n <sup>y</sup> -	
-n <sup>y</sup> -	-n-		-n-	-n <sup>y</sup> -	-ŋ-	-n <sup>y</sup> -	
-ŋ-	-n-		-n-	-ŋ-	-ŋ-	-ŋ-	-ŋ-

Proto-Nostratic	Proto-IE	Proto-Kartvelian	Proto-Afrasian	Proto-Uralic	Proto-Dravidian	Proto-Altaic	Proto-Eskimo
d <sup>y</sup> -	d <sup>h</sup> -	žg-	d <sup>y</sup> -	t <sup>y</sup> -	c-	ž-	c-
-d <sup>y</sup> -	-d <sup>h</sup> -	-žg-	-d <sup>y</sup> -	-t <sup>y</sup> -	-c(c)-/-y-	-ž-/-d-	-c-
t <sup>y</sup> <sup>h</sup> -	t <sup>h</sup> -	čk-	t <sup>y</sup> -	t <sup>y</sup> -	c-	č <sup>h</sup> -	c-
-t <sup>y</sup> <sup>h</sup> -	-t <sup>h</sup> -	-čk-	-t <sup>y</sup> -	-t <sup>y</sup> -	-c(c)-/-y-	-č <sup>h</sup> -	-c(c)-
t' <sup>y</sup> -	t'-	č'k'-	t' <sup>y</sup> -	t <sup>y</sup> -	c-	č-	c-
-t' <sup>y</sup> -	-t'-	-č'k'-	-t' <sup>y</sup> -	-t <sup>y</sup> t <sup>y</sup> -	-c(c)-/-y-	-č-	-c-
s <sup>y</sup> -	s-	šk-	s <sup>y</sup> -	s <sup>y</sup> -	c-	s-	
-s <sup>y</sup> -	-s-	-šk-	-s <sup>y</sup> -	-s <sup>y</sup> -	-c(c)-/-y-	-s-	

Proto-Nostratic	Proto-IE	Proto-Kartvelian	Proto-Afrasian	Proto-Uralic	Proto-Dravidian	Proto-Altaic	Proto-Eskimo
ʒ-	d <sup>h</sup> -	ʒ-	ʒ-	č-	c-	ž-	c-
-ʒ-	-d <sup>h</sup> -	-ʒ-	-ʒ-	-č-	-c(c)-	-ž-/d-	-c-
č <sup>h</sup> -	t <sup>h</sup> -	c-	c-	č-	c-	č <sup>h</sup> -	c-
-č <sup>h</sup> -	-t <sup>h</sup> -	-c-	-c-	-č-	-c(c)-	-č <sup>h</sup> -	-c(c)-
c'-	t'-	c'-	c'-	č-	c-	č-	c-
-c'-	-t'-	-c'-	-c'-	-č-	-c(c)-	-č-	-c-
s-	s-	s-	s-	s-	c-	s-	
-s-	-s-	-s-	-s-	-s-	-c(c)-	-s-	
z-	s-	z-	z-	s-		z-	
-z-	-s-	-z-	-z-	-s-			

Proto-Nostratic	Proto-IE	Proto-Kartvelian	Proto-Afrasian	Proto-Uralic	Proto-Dravidian	Proto-Altaic	Proto-Eskimo
ž-	d <sup>h</sup> -	ž-	ʒ-	č-	c-	ž-	c-
-ž-	-d <sup>h</sup> -	-ž-	-ʒ-	-č-	-c(c)-	-ž-/d-	-c-
č <sup>h</sup> -	t <sup>h</sup> -	č-	c-	č-	c-	č <sup>h</sup> -	c-
-č <sup>h</sup> -	-t <sup>h</sup> -	-č-	-c-	-č-	-c(c)-	-č <sup>h</sup> -	-c(c)-
č'-	t'-	č'-	c'-	č-	c-	č-	c-
-č'-	-t'-	-č'-	-c'-	-č-	-c(c)-	-č-	-c-
š-	s-	š-	s-	s-	c-	s-	
-š-	-s-	-š-	-s-	-s-	-c(c)-	-s-	

Proto-Nostratic	Proto-IE	Proto-Kartvelian	Proto-Afrasian	Proto-Uralic	Proto-Dravidian	Proto-Altaic	Proto-Eskimo
tʃ <sup>h</sup> -	k <sup>h</sup> -	x-	tʃ-	s <sup>y</sup> -	c-	š-	ʃ-
-tʃ <sup>h</sup> -	-k <sup>h</sup> -	-x-	-tʃ-	-δ-	-k-		-ʃ-
tʃ'-	k'-		tʃ'-	δ <sup>y</sup> -	t-		
-tʃ'-	-k'-		-tʃ'-	-δ <sup>y</sup> -	-t(t)-		

Proto-Nostratic	Proto-IE	Proto-Kartvelian	Proto-Afrasian	Proto-Uralic	Proto-Dravidian	Proto-Altaic	Proto-Eskimo
g-	g <sup>h</sup> -	g-	g-	k-	k-	g-	k- q-
-g-	-g <sup>h</sup> -	-g-	-g-	-x-	-k-	-g-	-ɣ-
k <sup>h</sup> -	k <sup>h</sup> -	k-	k-	k-	k-	k <sup>h</sup> -	k- q-
-k <sup>h</sup> -	-k <sup>h</sup> -	-k-	-k-	-k(k)-	-k(k)-	-k <sup>h</sup> -	-k(k)- -q(q)-
k'-	k'-	k'-	k'-	k-	k-	k-	k- q-
-k'-	-k'-	-k'-	-k'-	-k-	-k(k)-	-k-	-k- q-

Proto-Nostratic	Proto-IE	Proto-Kartvelian	Proto-Afrasian	Proto-Uralic	Proto-Dravidian	Proto-Altaic	Proto-Eskimo
g <sup>w</sup> -	g <sup>wh</sup> -	gw/u-	g <sup>w</sup> -	k-	k-	g-	k- q-
-g <sup>w</sup> -	-g <sup>wh</sup> -	-gw/u-	-g <sup>w</sup> -	-x-	-k-	-g-	-γ-
k <sup>wh</sup> -	k <sup>wh</sup> -	kw/u-	k <sup>w</sup> -	k-	k-	k <sup>h</sup> -	k- q-
-k <sup>wh</sup> -	-k <sup>wh</sup> -	-kw/u-	-k <sup>w</sup> -	-k(k)-	-k(k)-	-k <sup>h</sup> -	-k(k)- -q(q)-
k <sup>'w</sup> -	k <sup>'w</sup> -	k <sup>'w</sup> /u-	k <sup>'w</sup> -	k-	k-	k-	k- q-
-k <sup>'w</sup> -	-k <sup>'w</sup> -	-k <sup>'w</sup> /u-	-k <sup>'w</sup> -	-k-	-k(k)-	-k-	-k- -q-

Proto-Nostratic	Proto-IE	Proto-Kartvelian	Proto-Afrasian	Proto-Uralic	Proto-Dravidian	Proto-Altaic	Proto-Eskimo
g-	g <sup>h</sup> -	g-	g- (?)	k-	k-	g-	k- q-
-g-	-g <sup>h</sup> -	-g-	-g- (?)	-x-	-k-	-g-	-γ-
q <sup>h</sup> -	k <sup>h</sup> -	q-	q- (?)	k-	k-	k <sup>h</sup> -	k- q-
-q <sup>h</sup> -	-k <sup>h</sup> -	-q-	-q- (?)	-k(k)-	-k(k)-	-k <sup>h</sup> -	-k(k)- -q(q)-
q <sup>'</sup> -	k <sup>'</sup> -	q <sup>'</sup> -	q <sup>'</sup> - (?)	k-	k-	k-	k- q-
-q <sup>'</sup> -	-k <sup>'</sup> -	-q <sup>'</sup> -	-q <sup>'</sup> - (?)	-k	-k(k)-	-k-	-k- -q-
q <sup>'w</sup> -	k <sup>'w</sup> -	q <sup>'w</sup> /u-	q <sup>'w</sup> - (?)	k-	k-	k-	k- q-
-q <sup>'w</sup> -	-k <sup>'w</sup> -	-q <sup>'w</sup> /u-	-q <sup>'w</sup> - (?)	-k-	-k(k)-	-k-	-k- -q-

Proto-Nostratic	Proto-IE	Proto-Kartvelian	Proto-Afrasian	Proto-Uralic	Proto-Dravidian	Proto-Altaic	Proto-Eskimo
ʃ-	ʃ <sup>h</sup> -	∅-	ʃ-	∅-	∅-	∅-	∅-
-ʃ-	-ʃ <sup>h</sup> -	-∅-	-ʃ-	-∅-	-∅-	-∅-	-∅-
ħ-	ħ <sup>h</sup> -	x-	ħ-	∅-	∅-	∅-	∅-
-ħ-	-ħ <sup>h</sup> -	-x-	-ħ-	-∅-	-∅-	-∅-	-∅-
?-	?-	∅-	?-	∅-	∅-	∅-	∅-
-?-	-?-	-∅-	-?-	-∅-	-∅-	-∅-	-∅-
h-	h-	∅-	h-	∅-	∅-	∅-	∅-
-h-	-h-	-∅-	-h-	-∅-	-∅-	-∅-	-∅-

Proto-Nostratic	Proto-IE	Proto-Kartvelian	Proto-Afrasian	Proto-Uralic	Proto-Dravidian	Proto-Altaic	Proto-Eskimo
y-	y-	y-/∅-	y-	y-	y-/∅-		y-
-y-	-y-		-y-	-y-	-y-	-y-	-y-
w-	w-	w-	w-	w-	v-/∅-		v-
-w-	-w-	-w-	-w-	-w-	-v-		-v-

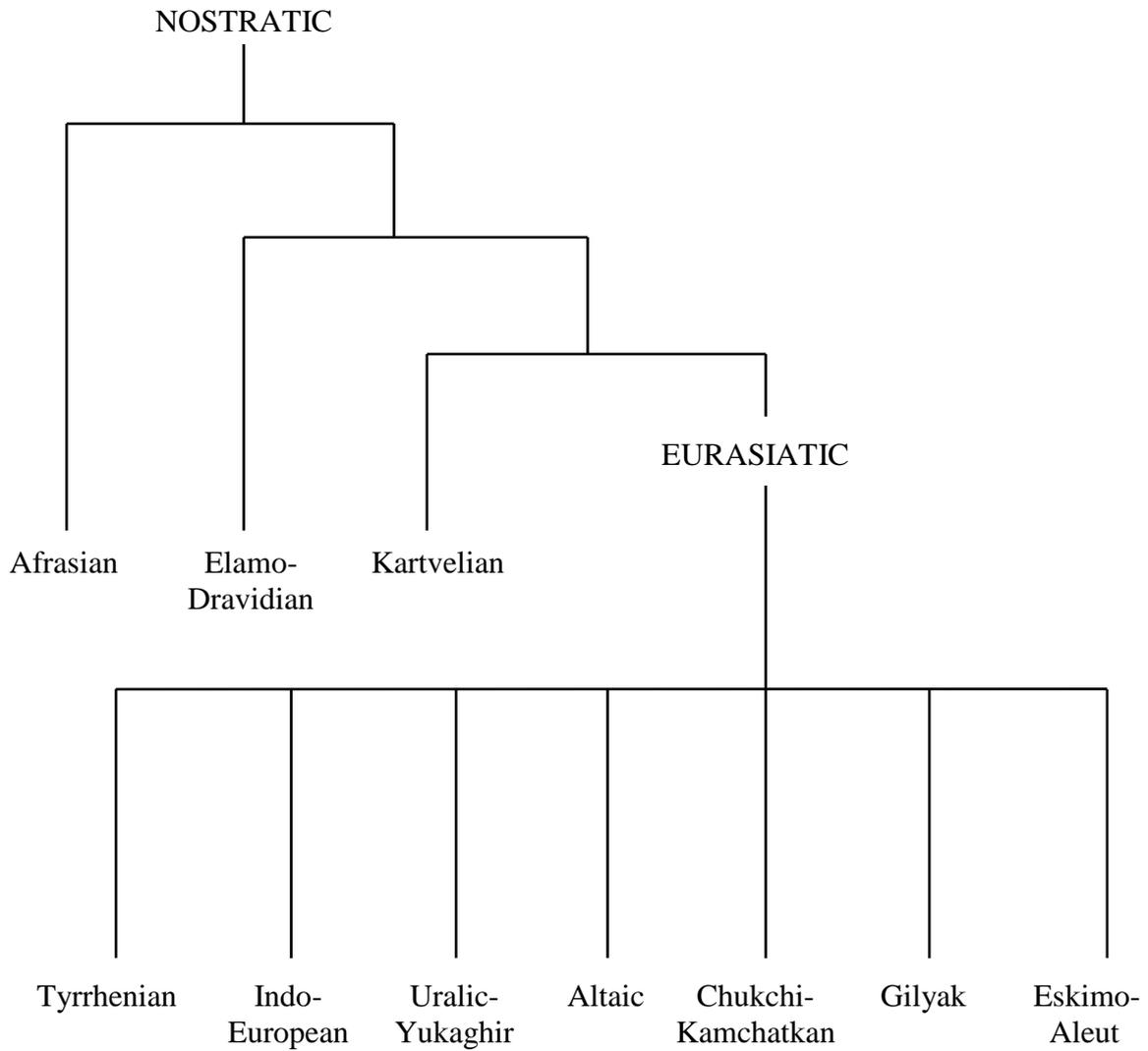
Proto-Nostratic	Proto-IE	Proto-Kartvelian	Proto-Afrasian	Proto-Uralic	Proto-Dravidian	Proto-Altaic	Proto-Eskimo
l-	l-	l-	l-	l-	l-	l-	
-l-	-l-	-l-	-l-	-l-	-l-	-l-	-l-
-ly-	-l-	-l-	-l-	-ly-	ɭ-	-ly-	-y-
r-	-r-	-r-	-r-	r-			
-r-	-r-	-r-	-r-	-r-	-r-/-r̥-	-r-	-R-
-ry-	-r-	-r-	-r-	-ry-	-r̥-	-ry-	

Vowels

Proto-Nostratic	Proto-IE	Proto-Kartvelian	Proto-Afrasian	Proto-Uralic	Proto-Dravidian	Proto-Altaic	Proto-Eskimo
i	i e	i	i	i	i	i	i
ə	e a ə	e i	i u	e	e	e	ə
u	u o	u	u	u	u	u	u
e	e	e	e	e	e	e	i
a	a o ə	a	a	a ä	a	a	a
o	o	o	o	o	o	o	u
iy	ÿ ey ī ē ĭ	iy i	iy	iy i	iy ī		iy
əy	ey ay ŷ ĭ	ey i	iy uy	ey	ey ē		əy
uy	ÿ ī ĭ	uy i	uy	uy	uy ū		uy
ey	ey ŷ ē ĭ	ey i	ey	ey e	ey ē		iy
ay	ay oy ŷ ĭ	ay i	ay	ay äy	ay ā		ay
oy	oy ŷ ĭ	oy i	oy	oy	oy ō		uy
iw	ū ũw ũ	iw u	iw	iw	iv ī		iv
əw	ew aw ūw ũ	ew u	iw uw	ew	ev ē		əv
uw	ū ō ũw ow ū	uw u	uw	uw u	uv ū		uv
ew	ew ŷw ũ	ew u	ew	ew	ev ē		iv
aw	ow ŷw ũ	aw u	aw	aw äw	av ā		av
ow	ō ow ūw ũ	ow u	ow	ow o	ov ō		uv

Note: The Proto-Altaic vowels given above are according to Starostin—Dybo—Mudrak's (2003) reconstruction. The developments of the sequences \*iy, \*əy, \*uy, \*ey, \*ay, \*oy, \*iw, \*əw, \*uw, \*ew, \*aw, \*ow in Proto-Altaic are unclear.

Appendix 2: *Internal Branching of the Nostratic Macrofamily according to Bomhard*



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