

## **Glottalization in Eastern Armenian**

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Informant-based data from Eastern Armenian suggest very strongly that glottalization in some Armenian languages extends far beyond the scope of culture word borrowings from neighboring Caucasian and Kartvelian languages. Five glottalic egressives occur frequently in basic vocabulary, including three primary numbers, while aspirated stops are infrequent and sporadic in their occurrence. A companion list from Western Armenian, also informant-based, is presented simply to show contrast; it reveals no glottalization in basic vocabulary yet frequent aspiration. A simple conclusion is that one of these Armenian languages has changed since the time of Proto-Armenian. It is suggested that Eastern Armenian is the one which changed least. Its data are highly relevant to the controversy over possible glottalization in Proto-Indo-European itself.<sup>1</sup>

Since documented glottalization is so rare in Indo-European languages, a search for some non-glottalized languages which entered areally glottalized regions is made to assess whether alien phonology can extend into the core of the lexicon.

### **Recording the Corpora**

The first corpus was recorded by Ms. Polly Spiegel, a student at Boston University, for a class report (research project) in linguistic field methods. Her informant was very careful to say that she was speaking 'proper Armenian.' She followed the

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<sup>1</sup>One should note in general that one part of Glottalic PIE theory states that only one glottalized consonant can occur in the same root. We can call that Monoglottalic Theory. Pisowicz pointed out that such a rule does not pertain in Ethiopian languages. Moreover it is not true in this dialect of Eastern Armenian where such words as [p<sup>h</sup>âst<sup>h</sup>ik<sup>h</sup>] 'small,' [âspit<sup>h</sup>ak<sup>h</sup>] 'white,' and [k<sup>h</sup>ap<sup>h</sup>uit<sup>h</sup>] 'blue' contain *three* different glottalized consonants. Also in Ethiopic Amharic three such can also occur. Consider /k<sup>h</sup>ât<sup>h</sup>ât<sup>h</sup>â/ 'straight, direct' and its derivative /ak<sup>h</sup>êač<sup>h</sup>a/ 'direction'; here a root with two glottalized consonants yields a noun with three through palatalization. Since even Kartvelian, a source language for this theory, shows several cases with more than one glottalic in a root, the bases of Monoglottalic Theory seem puzzling.

writing system carefully and seemed to correct her own speech in accordance with written Armenian. She said that she represents the Western variety of Armenian, that which is most common among American Armenians, at least around Boston's large Armenian community. Another informant from the same variety was used to settle a few confusing phonetic problems, not relevant here. Since Western Armenian is well-known, Spiegel's data are repeated here merely for contrast's sake. They are reported under the rubric *Spiegli*. Her aspirates were tested for phonemic contrast with other consonants.

The second corpus was given by a student at Boston University, named Alenoosh Stepanians. Although she was a native of Watertown, Massachusetts, she was unable to speak or understand Western Armenian. Her speech was Eastern Armenian. She said it was based on Tehran and the common Armenian of Iran and Soviet Armenia. Her grandmother's Armenian dialect was from Salmast, Iran, not far from Tabriz. Alenoosh was unable to understand her grandmother's Salmastian Armenian any more than she could understand Western Armenian. So it would appear that the Armenian of Tabriz (actually north Urmia) is a third variety, distinct from Western or the Eastern represented by Alenoosh. For convenience we will call Alenoosh's language/dialect *Alnushi*.<sup>2</sup> Despite the traditional viewpoint that the Armenian varieties are dialects of one language, it would appear from the mutual unintelligibility of the varieties that they are languages which once were dialects.

It is noteworthy that the strong ethnic and religious feelings which act as a centripetal force to bind Armenians together also work against the notion of Armenian languages. Since the time of Classical or Old Armenian from which the 'dialects' are supposed to be derived is circa 500 AD, then Armenian's internal diversity should compare roughly to those of Romance or Germanic. Romance has no less than ten recognized languages with many dialects. Were the Italian dialects given more weight we would add two more languages

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<sup>2</sup>Alnushi was recorded in 1982. Since then I have lost track of her. Unfortunately, we cannot determine her name for her variety of Armenian, nor can we verify by tape recording the sounds which I heard, nor can I locate her grandmother from Salmast. Her variety may be close to Meghri because she used /-lis-/, a bound form peculiar to Meghri and a few others, in one verb paradigm.

(Sicily or Abruzzi or Napolitan). Although younger, Germanic has eight recognized languages in varying degrees of mutual unintelligibility. Only Greek has less *recognized* internal diversity than Armenian. Tsaconian of the Peleponnesus, often called a dialect of Modern Greek, is descended from Dorian. The same centripetal forces are at work in Greek.

Seemingly unchallenged is the assumption that modern Armenian dialects are descended from Classical or Old Armenian of the fifth century after Christ. However, there must have been dialects present before Classical times; otherwise whence came Classical?<sup>3</sup> Some have also argued that Armenian has probably been in or near its present location since the time of the classical Greeks in the 5th century before Christ at least (being mentioned by Herodotus), while others say the true date is 1200 BC. Not all 'dialects' are necessarily descended from Old Armenian which is much younger than Proto-Armenian. If Greek be our guide, then perhaps another language like Tsaconian, coming from before the Classical period, did survive to modern times.

Much appreciated help on the dialect question came from Professor Bert Vaux of Harvard University. He and the pertinent literature postulate about 32 dialects and altogether 120 sub-dialects or dialect locations. There is no statement about mutual intelligibility or how many dialects obtain language status. Notwithstanding the rather fluid definition of 'dialect' vis-a-vis 'language' in that literature, by ordinary reckoning Armenian seems to contain a number of languages. Yet a clear moiety division into Western and Eastern Armenian is stipulated, along with a common literary language and centripetal cultural tradition. In many ways it reminds one of Latin/Romance and Chinese.

### Glottalized Consonants

A note on my hearing or perception of glottalized consonants, as opposed to aspirated. While I hear the difference between aspirated and unaspirated stops—because of the allophonic differences in English and some experience with informants from India—my primary expertise is with Afroasiatic and Nilo-Saharan languages. In the field I recorded data from perhaps

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<sup>3</sup>However, A. Richard Diebold informs me that in the literature which I have not examined the above assumption has been challenged, especially by Werner Winter, Djahukian, and others.

60 different languages, spread out over three field trips for a total of about five years field work. I am very familiar with glottalic egressives (ejected) and ingressives (imploded or injected) and somewhat less used to clicks. I worked exclusively with Alenoosh, gathering all that data, and I testify that I heard the glottalized consonants reported herein *very clearly*. I heard no pharyngeals in Armenian, nor lateral fricatives, nor lateral affricates (glottalized or not); those are common in Caucasian languages, as well as South Cushitic and Modern South Arabian.

The five glottalized consonants in Alenoosh's speech are remarkably similar to those of Amharic, the dominant Semitic Ethiopic language of Ethiopia, and thus particularly familiar to me from field work. An ordinary [p<sup>̣</sup> t<sup>̣</sup> k<sup>̣</sup>] glottalized series was supplemented by two glottalized affricates [ts<sup>̣</sup> č<sup>̣</sup>], with [p<sup>̣</sup>] being less frequent and [k<sup>̣</sup>] most frequent, as in Amharic. While in Amharic [t<sup>̣</sup>] is more common than [ts<sup>̣</sup>] and its allophone [s<sup>̣</sup>], the opposite was true in Eastern Armenian. In Amharic [ts<sup>̣</sup>] correlates with Geez loan words and might be considered an allophone of [t<sup>̣</sup>] in the speech of educated people. But in Armenian the [ts<sup>̣</sup>] seems deeply embedded in the native lexicon.

As in the case of Afrasian linguistics, the five glottalized consonants tend to correspond to voiced consonants in Western Armenian. It is even possible to hear the change from glottalic to voiced in the speech of some Ethiopians, although the change is socially denigrated. It is also quite distinct from a typical foreigner learning Amharic who de-glottalizes voiceless consonants. The following scheme sums this up:

Alnushi Armenian	Western	Change in Ethiopia	Foreigners
p <sup>̣</sup>	b	p <sup>̣</sup> > b or p <sup>̣</sup> > b <sup>̣</sup>	p <sup>̣</sup> > p
t <sup>̣</sup>	d	t <sup>̣</sup> > d or d <sup>̣</sup>	t <sup>̣</sup> > t
ts <sup>̣</sup>	dz	ts <sup>̣</sup> > t <sup>̣</sup>	ts <sup>̣</sup> > ts/s
č <sup>̣</sup>	j	(few observed) č <sup>̣</sup> > j <sup>̣</sup> (rare)	č <sup>̣</sup> > č
k <sup>̣</sup>	g	k <sup>̣</sup> > g k <sup>̣</sup> > ɣ k <sup>̣</sup> > g <sup>̣</sup>	k <sup>̣</sup> > k

Conversely, in plain consonants a reverse situation seems to apply. Western Armenian's voiceless consonants, especially [p, t, ts, č, k] often correspond to voiced Alnushi ones, e.g. [b, d, dz, j, g].

The "Change in Ethiopia" column shows occurrence noted in scores of languages, hence the greater variety. Some of the examples are from South Omotic languages where normal Amharic egressives are usually imploded (eventually) after borrowing. Since most linguistic informants in Ethiopia speak Amharic, and often are interrogated in Amharic, they frequently substitute the egressives of Amharic for the ingressives of their own languages. This is due to the prestige of Amharic and the felt need to "be correct." Thus the [bʲ] and [dʲ] of non-Semitic languages are often reported as [pʲ] and [tʲ]. When informants feel more secure about rendering their native speech properly, the number of imploded consonants increases. The imploded [jʲ] of some Cushitic languages is genuinely rare; thus examples of their transformations do not easily come to mind.

### Comparative Data

The data are presented in three columns. Strict alphabetization is preempted by semantically close or cognate terms to enhance comparison. Thus note several versions of 'die' or 'finger.' The first column lists the English meanings. The second column has the relevant forms recorded by Polly Spiegel, while the third column has Alnushi. In both columns supplementary data are cited also, usually to show verb roots more clearly. In the Spiegli and Alnushi data morphological cuts are made by myself—by hypothesis. In the two data columns many forms suggested by expert Armenologist, Bert Vaux, are listed in brackets after the recorded data. In general his forms are standard, either SWA (Standard West Armenian) or SEA (Standard East Armenian). Also one notes that he writes more aspiration than either Spiegel or Fleming, surely due to his much greater command of Armenian and its dialects.

### Note on Transcription

Columns two and three are written phonetically with no attempt at phonemes or underlying forms. Bert Vaux's SWA and SEA forms tend to be phonemic; as basically underlying forms or at least standard they are written in the morphemic

transcription as { C }. Generally an Africanist version of IPA is used. In the vowels the symbols [ə, ɛ, ɪ ə] represent the vowels expected in Standard American 'but, bet, bit, bought', qualitatively different from and also usually shorter than the expected [a, e, i, o] of Italian. Vowel length, while not much of a recording problem, was transcribed in the Africanist manner as [aa, ee, ii, oo]. Stress differences were not systematically recorded, other than the occasional clear strong stress, marked as [á, é], etc. In consonants the common Africanist rejection of [j] for [ɣ] is followed. Thus [j] stands for the affricate not the semi-vowel. Similarly [c] is rejected as symbol for the affricate represented by [ts]. However, Africanist usage is not followed for [c], so that the affricate 'ch' and the fricative 'sh' are represented in the Czech manner by [č] and [š]. Aspiration is marked by super-script [ʰ], while abrupt non-aspiration is marked with [=]. Glottalization is represented by super-script [ʔ], thus [tʔ] is a glottalized [t]. Finally, what I initially wrote as [ɣ], a voiced velar fricative, was changed to an uvular trill on the advice of Vaux. I write it as [R].

The glossary given here is essentially a basic vocabulary list, supplemented by other data. Such a list has many advantages for a field worker. One expects the interlingual synonyms to be of high frequency, to have high cognitive saliency, to be among the earliest words learned in childhood, and to be conservative in tendency, i.e., replaced at a slower rate than ordinary vocabulary, and with the whole list tending to display most of the significant phonology of the language. The English glosses are in alphabetical order, rather than in an order given by Armenian, primarily to show the above features more clearly.

<b>English gloss</b>	<b>Spiegli Armenian</b>	<b>Alnushi Armenian</b>
all	pilor {pholor} <sup>4</sup>	bolóor {bolor} ammen
	{amen}	{amen}
ashes	moxír-ner	moxír
bark (tree)	—	k <sup>ʔ</sup> oč <sup>ʔ</sup> iR / k <sup>ʔ</sup> oč <sup>ʔ</sup> Rə {kočR}

<sup>4</sup>Note: The symbol [ç] is used for a forward [x] in the original. It is sometimes voiced 'a little.' Bert Vaux was sure that the sound was [R]. In his transcription {j} = my [dz], while his {c} = my [ts]. His [r] with a superscript dot = my [rr] which I write as [r:] in his forms.

beard		miruk {moruk <sup>h</sup> 'SEA'}
belly	vorovain	por {p <sup>h</sup> or}
big	meds {mej}	mets <sup>ʔ</sup> {mec}
bird	turrčyun {t <sup>h</sup> ər:č <sup>h</sup> un}	terrčún {t <sup>h</sup> ər:č <sup>h</sup> un}
bite, to	xadzn-el {xajnel}	k <sup>ʔ</sup> ets <sup>ʔ</sup> e-lle k <sup>ʔ</sup> əts <sup>ʔ</sup> -ii (bite!)
black	sev	sev
blood	aryún	aryun arúna (red) (not regular) {arun 'red'} {arún-a 'it is red'} k <sup>ʔ</sup> ap <sup>ʔ</sup> uit <sup>ʔ</sup> {kapuyt}
blue		vos kórr {voskor:}
bone	—	pəR-oskrr (elephant bone) {p <sup>h</sup> iR 'elephant'} <sup>5</sup> ostoxón (Persian 'bone') gurts <sup>ʔ</sup> k <sup>ʔ</sup> / k <sup>ʔ</sup> urts <sup>ʔ</sup> k <sup>ʔ</sup> (also = 'chest') {kurtsk <sup>h</sup> }
breast (female)	gurtsk <sup>h</sup> {gurdzk <sup>h</sup> -er}	dooš (in Salmast = chest) surč <sup>ʔ</sup> -a-guin (dark brown or 'coffee-color') {sərčaguyn}
brown		erve-ll (burn by itself) {ervel 'burn-intran.' in Eastern dialects}
burn, to	aiyr-il / aiyyr-il {ayril}	k <sup>ʔ</sup> ərák <sup>ʔ</sup> e-ll (to fire) {kərakel}
	varr-il (trans) {var}	k <sup>ʔ</sup> ərak <sup>ʔ</sup> -t <sup>ʔ</sup> a-ll (trans.) {kərak tal 'fire give'}

<sup>5</sup>'Elephant' here is most likely borrowed from old Semitic, as in Akkadian /piilu, piiru/ or Aramaic /piil/, where aspiration is not contrastive. More recent sources are New Persian /piil/ and Arabic /fiil/. The change from older /\*l/ to modern Armenian /R/ is quite unusual, suggesting an unknown suffix in some past time.

claw	jaŋg	čʰɔnkʰ čʰɔnkʰ-err-ell (scratch) yəRunk (fingernail) ampʰ
cloud	amb	
to cloud over	ám-b-ell	
cold	baç {baR}	tsurtʰ {cʰurt}
	sarr (ice)	
come, to	ka-v (he came) {yəgav}	gɔ-ll {gol 'to come' in New Julfa dialect of Isfahan, Iran}
	yergu-r (you come) {yəgur 'come!'}	yekʰa/kʰa (complex verb) {yeka 'I came'}
	{kʰal 'to com' SWA}	aɣí (come!) {gal 'to come' 'SEA'}
curly (hair)		gaŋgur (curly) gaŋgra-herž (curly hair)
dawn		lusabats {lusabachʰ}
die, to	merrn-ill  {mer:nil}	mèrrn-ell (of ordinary folk)  merr-i (die!) mɔhɔn-a-ll (ordinary folk) {mahanal} mɔh (death) {mah} satkʰe-ll (of animals) {satkel} vaxčʰanve-ll (of the famous) {vaxčanvel} vaxčʰan (the end) {vaxčan} sov-a-mɔh (to starve = famine-a-death) {sovamah}
dog	šûn (singular)	šun (singular)
the dogs	šun-er-ı {šunera}	šun-er / -erž / -erʰ (pl) {-erž < -r, (voiceless) < /-er/}
drink, to	x ım-ell {xəmel}	xəm-ell {xəmel}



dry	čor {č <sup>h</sup> or}	čor {č <sup>h</sup> or} čor-atsa-v (it dried) {č <sup>h</sup> orac <sup>h</sup> av}
ear	oç (earring)	ɔk <sup>ʔ</sup> ɔnjə, ɔk <sup>ʔ</sup> ɔnjmer (pl) {akang̃}
earth	yergir	geɽ <sup>ʔ</sup> iin {getin} hat <sup>ʔ</sup> ok <sup>ʔ</sup> hooRr (soil) {hoR}
eat, to	ud-ɛl	ut-ell yes ut-um-ɛm (I eat) {yes utum em} k <sup>ʔ</sup> er (eat!)
egg	havgit {-t <sup>h</sup> }	dzu (sg) / dzəver (pl) k <sup>ʔ</sup> it (inferred from next) {-th} həf-k <sup>ʔ</sup> it (hen's egg) həv (chicken, hen)
eye	agîn (classical) {akn 'Classical'}	ɔčk <sup>ʔ</sup> (sg) / ɔč-er (pl) ač-er (pl 'Standard Eastern') <sup>6</sup>
	'Standard Western'	áč-k (pl) {ač <sup>h</sup> k <sup>h</sup> }
fat (of meat)	yuç {yuR} {ğarb} kər (adj. 'fat')	ačk <sup>ʔ</sup> umet (in thy eye) {same in Tiflis dialect} č <sup>ʔ</sup> arp <sup>ʔ</sup> yuRr (oil, fat) {yuR}
feather	pədur {p <sup>h</sup> ədur}	pətur {p <sup>h</sup> ətur 'Some dialects have [r:]'}
finger	mad {mad}	mɔɽ <sup>ʔ</sup> {mat}
(thumb)	pita-mad {p <sup>h</sup> ət <sup>h</sup> amad}	buta-mɔɽ <sup>ʔ</sup> {bət <sup>h</sup> amat}
(index)	ts <sup>h</sup> itsa-mad	
(middle)	mične-mad	
(ring finger)	mádne-mad	
(little finger)	čiguwid	
fire	gırag {gərag}	k <sup>ʔ</sup> ərák <sup>ʔ</sup> {kərak}

<sup>6</sup>Standard Eastern and Standard Western, as here used, are those perceived by Alenoosh. Bert Vaux's are labeled SWA and SEA or included within brackets {}.

fish	tsug {c <sup>h</sup> ug}	dzuk <sup>č</sup> {juk}
five	hiŋk {hiŋk}	hiŋg <sup>h</sup> (g <sup>h</sup> = aspirated g) {hiŋg}
fly, to	turr-il {t <sup>h</sup> ər:il}	terne-ll
fly (bug)	janj {gāng}	jɔŋjə / č <sup>č</sup> ɔŋjə č <sup>č</sup> ɔŋč <sup>č</sup> ə (dictionary word) {maybe čanč <sup>č</sup> }
fog		mæg
food	{geragur}	k <sup>č</sup> erakur {kerakur}
foot	vodk <sup>h</sup> (sg) {ditto} vodk <sup>h</sup> -er (pl)	vot <sup>č</sup> (+ leg) {vot(k <sup>h</sup> )} mɔn-ga-l (to go by foot) {man gal}
four	čors {č <sup>h</sup> ors}	čoors {č <sup>h</sup> ors}
full	lets <sup>h</sup> un  {lec <sup>h</sup> un}	liikə (dominant word) {lik <sup>h</sup> } letsun {lec <sup>h</sup> un}
give, to	da-l	h <sup>č</sup> erik (r is lateralized) t <sup>č</sup> a-ll (retroflex t) {tal} neverž (gift) {nəver} t <sup>č</sup> ur ast <sup>č</sup> vats <sup>č</sup> (God) {astvac}
god, God		
go, to	ger-	gən-
good	pari {p <sup>h</sup> ari}	lav
‘things are good’	lāven {lav en ‘good are’}	
grass	—	xot <sup>č</sup> {xot} xod (self, in Persian)
green	ganač <sup>h</sup> {gananč <sup>h</sup> ‘SWA’} {kanač <sup>h</sup> ‘Classical’}	k <sup>č</sup> anač {kanač <sup>h</sup> }
hair	maz her	mɔz herž < /her <sub>o</sub> /
hand	ts <sup>h</sup> erk {cher:k <sup>h</sup> }	dzerrk (+ wing, arm) {jer:k <sup>h</sup> }
head	{k <sup>h</sup> əlux}	gəlúx {gəlux}

hear, to	less-əl {ləsel}	lesə-ll {ləsel} les-iir (listen!) {ləsir}
heart	sird	sirtʰ
hen, chicken	hav	həf-kʰit (hen's egg) həv
hit (to) #1		xəpətsʰ
hit (to) #2		tsʰetsʰa-v
horn	yerrčʰyur {yeRčʰyur}	kʰotʰoš {kotoš}
huge		həskʰɔ {həska}
I (see pronouns, below)		
kill, to	sbann-əl {əspʰannel}	spɔn-ell {spanel} sɔtkʰɔtsn-ell (kill but more like to slaughter) {satkecʰnel}
	mərretshin-əl {mer:cʰənel}	
knee	dzunɡ {jung}	tsʰunɡkʰ {cunk}
		zaanu (from Persian)
know, to	kɪdná-l {khidnal}	imɔna-ll (savoir) {imanal}
		čʰɔnačʰ-ell (connaitre)
leaf	dərev {dərev}	tʰerev {tereʋ}
leg	sırunɡk (sg.) sırunɡk-nər (pl.) {sərunkʰ}	
lick, to		tsʰətsʰ-ell (to lick)
lie down, to	—	pʰɔrrkʰ-ell / bʰɔrrkʰ-ell {par:kel}
liver	liyárrt {lyartʰ}	jigær (< Persian) {giger, gīgär}
		leRi (2nd in usage) {leRi}
long	yergar	yekʰar / yerəkʰar
louse	{voğil} vočhíl (flea)	vočʰiil {vočil}
man	mart  {martʰ}	təRəm mart (male person)  {(taRa)mard}

many	šad	šəʔə {šat a 'it's a lot'}
meat	mis	miis {mis} uʔellik (something to eat) {utelikh}
moon	lusín {lusin}	lusiin moh (< Persian)
mountain	lerr {ler:}	sar (1st usage) lerr (bigger mt.) bəlúr (hill)
mouth	p <sup>h</sup> erán {p <sup>h</sup> eran}	berán širtuŋk <sup>h</sup> (lip) {šrt <sup>h</sup> unk <sup>h</sup> }
name	anún	ɔnun, ɔnun-er (names) {anunner 'names'} ɔnumer (he was doing) {anum er 'do he-was'}
neck	viz	viz k <sup>ʔ</sup> ok <sup>ʔ</sup> ord (throat)
new	nor	nor
night	kišér	gišer yerək <sup>ʔ</sup> o (evening) {yereko}
nose	kit <sup>h</sup> {kit <sup>h</sup> }	kit {kit <sup>h</sup> }
one	mæg	mek <sup>ʔ</sup>
other	—	uríš {uríš}
person	ants <sup>h</sup> {anc <sup>h</sup> }	mart {mard}
person-spirit	hoki {hok <sup>h</sup> i}	andz-mavořutyun (individual, single person) mart-ik <sup>h</sup> (people) {mardik} (cf 'warrior')
rain	antsrev {anchrev}	andzrev {anjrev} andzrev-um-ʔε (it's raining)
red	garmir	k <sup>ʔ</sup> armiirž {karmir} arúna (see 'blood')
river	{k <sup>h</sup> ed}	geʔ {get}
road	jampá {ǵampha}	čɔnaparr {čanaparh}
root	armád	armat <sup>ʔ</sup>

round	gilor {gəlor}	k <sup>ɨ</sup> əlorž {kəlor}
sand	aváz	ɔvazz {*[avaz] was expected)
say, to	iss-él {əsel}	ɔvaz (song < Persian) ɔs-ell {asel} (cf 'to speak')
see, to	dəssn-él {desnel}	t <sup>ɨ</sup> esn-ell {tesnel} t <sup>ɨ</sup> es (see!) nairž (look!) {nayir <sub>o</sub> }, serm
seed	hund	k <sup>ɨ</sup> oč <sup>ɨ</sup> (pit, of berry)
pit, of fruit	gud	k <sup>ɨ</sup> arč <sup>ɨ</sup> {karč}
short		
sip, to	umb-əl	
sit, to	nisdí-l {nəsdil}	nəst <sup>ɨ</sup> -ell {nəstel} nəst <sup>ɨ</sup> -iir (sit down!) {nəstir}
skin	mort {mort <sup>h</sup> }	mort (human or hide)
skull	kanj	gəngə (skull)
sky		y erk <sup>ɨ</sup> iinj <sup>ɨ</sup> {yerkinh}
sleep, to	kínana-l {k <sup>h</sup> ənanal}	kən-ell (1st in usage) {k <sup>h</sup> ənel} nənj-ell (2nd in usage) {nəngəl} nənj-aran (bedroom, i.e., place to sleep) {nəngəran}
sleep (noun)	yeráz {yeraz}	yiráz (a dream)
small	bızdík {bəzdig}	pokr (1st in usage) {p <sup>h</sup> ok <sup>h</sup> r} p <sup>ɨ</sup> əst <sup>ɨ</sup> ik <sup>ɨ</sup> (2nd in usage) {pəztik, pəstik} (cf 'teeny weeny' below)
smell, to		k <sup>ɨ</sup> áč <sup>ɨ</sup> áč <sup>ɨ</sup> (Pigmy) hotkaš-ell (to smell, tr) hot <sup>ɨ</sup> á-l (to smell, intr)
smoke	dzux {jux}	ts <sup>ɨ</sup> ux {cux}
to smoke	dzix-él  {jəxel}	ts <sup>ɨ</sup> əx-él (to smoke cigarette)  {cəxel}

soot	mur	xos-ell {xosel}
speak, to		k <sup>ʕ</sup> ɔŋgin-ell
stand, to	géna-l	k <sup>ʕ</sup> ɔŋgin-iir (stand up!) k <sup>ʕ</sup> ɔŋgni (stop!)
star	astç {asd(ə)R}	ɔstRa <sup>7</sup> {astR}
stone	k <sup>h</sup> ar (rock) {k <sup>h</sup> ar}	kar {k <sup>h</sup> ar}
sun	arev	ařev č <sup>ʕ</sup> arragaith (rays of sun)
swim, to	ločá-l {loRal}	loRa-ll {loRal} loRana-ll (to bathe) {loRanal}
tail	boč <sup>h</sup> {boč <sup>h</sup> }	p <sup>ʕ</sup> oč {poch}
teeny weeny		pič <sup>ʕ</sup> iilii (cf 'small')
tell, to		p <sup>ʕ</sup> ɔt <sup>ʕ</sup> m-ell/bot <sup>ʕ</sup> m-ell {patmel}
that	ad {at <sup>h</sup> }	en {en} en martə (that person) {en mardə} ain ('proper Armenian') {ayn} da ('proper Armenian')
that (yon)	an	— {en}
this	as	ess {es} es martə (this person) {es mardə} sa ('proper Armenian') {sa} ais ('proper Armenian') {ays}
thou (see pronouns, below)		
three	yérék {yerek <sup>h</sup> }	yerek <sup>h</sup> {yerek <sup>h</sup> }
tongue	ležu {lezu}	leezu (+ language) {lezu}
tooth	agrrá (pl) {agr::a} {adam}	at <sup>ʕ</sup> əm {atam}
tree	dzar {jar:}	ts <sup>ʕ</sup> arr {car:}
twilight		mətnšaR

<sup>7</sup>Note: the [ɣ] was checked. It is not an [r], although the general impression is of a French or standard German 'r' = [R].

urine		čiš (urine) {č <sup>h</sup> iš < Turkish}
walk, to	k <sup>h</sup> all-əl {k <sup>h</sup> aləl}	—
	step k <sup>h</sup> ail {k <sup>h</sup> ayl}	
warm	t <sup>h</sup> ak {dak <sup>h</sup> }	t <sup>z</sup> ak <sup>h</sup> {tak <sup>h</sup> }
		t <sup>z</sup> ak <sup>h</sup> -utyun (heat, e.g., of sun)
		{tak <sup>h</sup> ut <sup>h</sup> yun}
warrior		yerrman (boiling hot)
water	čur {č <sup>h</sup> ur}	mart <sup>z</sup> ik <sup>z</sup> (cf 'people')
wet	t <sup>h</sup> on (dew)	jur {ğur}
		tats (dripping wet)
wheel	ániiv	xónav (humid, wet)
whip		{aniv}
white	jermág	mət <sup>z</sup> rrak <sup>z</sup>
	{ğermag}	əsp <sup>z</sup> it <sup>z</sup> ak <sup>z</sup> (1st in usage)
very white	sbidág	{spitak}
		č <sup>z</sup> ermak <sup>z</sup> ('proper Armenian')
	{əsbidag}	{čermak}
woman	gin	k <sup>z</sup> in {kin}
wood	p <sup>h</sup> aid	pət <sup>z</sup> {p <sup>h</sup> et}
	{p <sup>h</sup> ayd}	pait <sup>z</sup> ('proper Armenian')
		{p <sup>h</sup> ayt}
yellow	tεçín {t <sup>h</sup> eRin}	dεRin {deRin}

### Pronouns: personal and interrogative

I	yes	yes
me	-inz/-inzi {-inji}	iindz
bound form	-m, -d	<sup>z</sup> em, -V (a, i, etc.)
my	-is	
I am	em	
thou	tun ('you') {t <sup>h</sup> un}	du
thee	{k <sup>h</sup> ez}	kez
bound form	-s, -r	- <sup>z</sup> es, -Vr (V= a, i, etc.)
thy	-id {-it <sup>h</sup> }	
thou art	εs	
he/she		na
him/her	zain	-neráán

bound form	-v, -e	- <sup>z</sup> e, -v, -0 (zero)
his/her	-t, suwin (his)	
he/she is	ε	
we	mεηk {mεηk <sup>h</sup> }	mεηk {mεηk <sup>h</sup> }
us		-mεzz
bound form	-iηk	- <sup>z</sup> iεηk, -Vηk (V=a, i, etc) {-εηkh, -Vηkh}
our	mεr (pl)	
we are	εηk	
you (pl)		duk <sup>h</sup> {duk <sup>h</sup> }
you (object)		dzezz {jez}
bound form	-k	- <sup>z</sup> εk, -ik
your	ter (pl) {cher}	
you-pl are	εk {εk <sup>h</sup> }	
they		nəraηk
them		-nəránts
bound form	-nn, -n	- <sup>z</sup> εn, -in
their	irézn (pl) {irench}	
they are	εn	
what?	inč {inč <sup>h</sup> }	inč
who?	ov	ov
where?		vort <sup>z</sup> eR
when?		yerp <sup>h</sup>
how?	inč bes {inč <sup>h</sup> bes}	inč p <sup>z</sup> es {inč <sup>h</sup> pes}
how much?		inč kan (what amount?) kan (amount)
<b>Numbers<sup>8</sup></b>		
one	meg	mek <sup>z</sup>
two	yergu	yerk <sup>z</sup> u
three	yerék {-k <sup>h</sup> }	yerék <sup>h</sup>
four	čors {č <sup>h</sup> -}	čors
five	hiηk {-k <sup>h</sup> }	hiηg
six	vets <sup>h</sup>	vets {-c <sup>h</sup> }

<sup>8</sup>Note: Vaux forms are indicated only by specific differences, such as an aspirated {č<sup>h</sup>} instead of [č], to spare us redundancy.



seven	yot <sup>h</sup> {-t <sup>h</sup> ə}	yot <sup>h</sup>
eight	ut {-t <sup>h</sup> ə}	ut <sup>h</sup>
nine	in {-ə}	innâ {innə, inə}
ten	das {-ə}	t <sup>ʔ</sup> as {tasə}
eleven	dásni-məg {dasnəmeg}	
twelve	dásny-ergúr {-ə-, -gu}	
thirteen	dásny-erək {-ə-}	
fourteen	dásni čors {-ə-} {-c <sup>h</sup> -} (sic)	
fifteen	dásni-hínk {-ə-} {-k <sup>h</sup> -}	
sixteen	dásni-vets {-ə-} {-c <sup>h</sup> -}	
seventeen	dásni-yótu {-ə-} {-t <sup>h</sup> c}	
eighteen	dásni-út {-ə-} {-t <sup>h</sup> c}	
nineteen	dásni-ini {-ə inə}	
twenty	kíssan {k <sup>h</sup> əsan}	ksan
thirty	yérrəs-sun {yeresun}	yerresun
forty	k <sup>h</sup> arras-sun {k <sup>h</sup> ar:asun}	karra-sun
fifty	hís-sun {-s-}	hits-tsun / hits <sup>ʔ</sup> un
sixty	vát <sup>h</sup> un {-c <sup>h</sup> -}	vats-tsun
seventy	yótana-sun {-t <sup>h</sup> -}	yotana-sun
eighty	ut-sun {-t <sup>h</sup> -}	ut-sun
ninety	ínni-sun {-â-}	innə-sun
hundred	háryur	haɣyur sad (< Persian)

Alenoosh and I did not do much morphology because her time was limited.

### The Sound Correspondences

Two sets of correspondences are given below. The first is just between Siegli (West Armenian) and Alnushi (East Armenian). It includes all the consonants but is aimed especially at the stops and affricates. Outside of those consonants there is 'very little action.' While there are some obvious vowel correspondences as between Alnushi and SEA (e.g., [ɔ] versus [a]) and between Alnushi and Spiegli (e.g., [ɔ] versus [a], also [ə] versus [ɪ] ), vowel correspondences are ignored in this paper. More important is the stipulation that the sound correspondences are based on etymologies, either known or obvious, rather than general Armenian expectations or sound laws. The second set includes SWA and SEA based entirely on the very helpful forms which Bert Vaux added to an earlier draft of this paper. In effect we are given two West Armenian

sets to compare with two East Armenian sets and with each other.

### SET 1

Plain versus plain: Siegli on left, Alnushi on right.

p = p	feather
v = v	black, foot, good, louse, neck, rain, sand, sun, who?, six, sixty
t = t	bird, to fly, man, skin, star
k = k	nose, we, twenty
č = č	dry, eye, four, what?, how?
s = s	black, four, hear, heart, kill, meat, moon, see, sit, star, this, white, I, how?, twenty, seventy, ninety
š = š	dog, many, night
z = z	hair, tongue
y = y	long, blood, sleep, three, I, two, seven, seventy, hundred
h = h	egg, five, fifty, hundred

### Nasal versus nasal:

m = m	ashes, big, cloud, die, drink, hair, finger, man, meat, one, red, root, skin, white, I-vb, we
n = n	bird, blood, claw, die, dog, five, fly, full, green, skull, kill, knee, moon, mouth, name, new, + person, rain, see, sit, woman, yellow, me, we, we-vb, they-vb, what?, how?, nine, twenty, ŋ = n
	seventy, -ty (in 20-90).

### Laterals and resonants versus laterals and resonants:

l = l	all, bite (+ most verb endings), full, give, good, hear, flea/louse, moon, mountain, round, swim, tongue
r = r	ashes, belly, blood, breast, dry, fire, four, heart, leaf, long, man, mouth, new, night, rain, red, root, skin, sleep/dream, stone, three, water, white, thee, two, 12-14
r = ʀ	sun, hundred
r = rr	feather, hand/wing, tree
rr = rr	bird, die, to fly, mountain, thirty, forty
r = r/rž	dogs, red, round

**Note:** Neither Siegel nor I reported hearing "Polish l" [t] which is

widely reported in Armenian dialects. I cannot account for this. Either we just missed it or it was not important in the dialects we recorded.

**'Gutturals,' i.e., velar fricative versus velar/uvular fricatives:**

x = x      drink, smoke  
ç = R      fat (of meat), star, swim, yellow

**Plain voiceless versus plain voiced: (Not numerous)**

p = b      all, thumb  
t = d      yellow, thou  
k = g      skull, night, five  
ts = dz    fish, person, rain  
č = j      water

**Plain voiced versus plain voiceless: (Rare)**

b = p      kill  
d = t/ʈ    eat, feather  
z = s      small

**Plain voiced versus voiceless ejective (glottalized):**

b = pʔ     cloud, small, tail, white, how?  
d = tʔ     foot, give, finger, heart, leaf, many, root, see,  
            sit, small, wood, white, ten  
g = kʔ     claw, egg, fire, fish, green, long, one, red,  
            round, white, woman, two  
g = g/kʔ   breast  
dz/ds = tsʔ    big, bite (ʔ), knee, smoke, tree  
j = čʔ      claw, fly, white

**Aspirated and voiceless plain versus voiceless ejective:**

t<sup>h</sup> = tʔ     warm  
k = kʔ     eye, small  
k<sup>h</sup> = kʔ    breast  
ts = tsʔ    breast  
č = čʔ      flea/louse

**Or aspirated voiceless versus plain voiced:**

p<sup>h</sup> = b      mouth

**SET 2**

When the data suggested by Bert Vaux are added to the comparisons, it appears that Siegal's West Armenian is not the

same as Vaux's SWA. We get these additional matchings:

The sequence is now set up as: Siegli = SWA = SEA = Alnushi.

**Plain voiceless stops, voiceless aspirated stops, plain voiced, and voiceless glottalized stops: (# = non-initial)**

p	= p <sup>h</sup>	= p <sup>h</sup>	= p	feather, good (1st two only), small (last two), bell (last two), road # (1st two)
p <sup>h</sup>	= p <sup>h</sup>	= p <sup>h</sup>	= p	wood
p	= p <sup>h</sup>	= b	= b	all, thumb
p <sup>h</sup>	= p <sup>h</sup>	= b	= b	mouth
b	= b	= p	= p̣	small, tail, white #, blue # (last two), how?, fat # (SWA + Alnushi), lie down (last two), tell (last two)
b	= p <sup>h</sup>	= p	= p	kill #
t	= t <sup>h</sup>	= t <sup>h</sup>	= t	bird, to fly (all but SEA), thumb #, skin #
t	= t <sup>h</sup>	= d	= t	man #
t	= t <sup>h</sup>	= d	= d	yellow, thou
t <sup>h</sup>	= t <sup>h</sup>	= t <sup>h</sup>	= t	nose #
t <sup>h</sup>	= t <sup>h</sup>	= t <sup>h</sup>	= t <sup>h</sup>	seven #
t	= t <sup>h</sup>	= t <sup>h</sup>	= t <sup>h</sup>	eight #
d	= d	= t	= ṭ	leaf, many # (but not SWA), tell # (last two), see, sit #, small #, wood #, white #, river # (not SWA), ten, give (not SWA), tooth # (not 1st), finger #
t <sup>h</sup>	= d	= t	= ṭ	warm
t	= d	= t	= t	star #
k	= k	= k	= k	nose
k	= k <sup>h</sup>	= k <sup>h</sup>	= k	sleep, we #, thee (SWA + Alnushi), we/we are # (not SWA), twenty (not SEA), hand #
k <sup>h</sup>	= k <sup>h</sup>	= k <sup>h</sup>	= k	stone, forty (not SEA), foot (not Alnushi)
k <sup>h</sup>	= k <sup>h</sup>	= k <sup>h</sup>	= k <sup>h</sup>	three #, you # (last two), lip # (last two)
k	= k <sup>h</sup>	= g	= g	night (not SEA), person-spirit (1st two), five # (not SEA), night
k	= k <sup>h</sup>	=	= ḳ	eye # (not SEA)
k	= g	= k	= ḳ	small #, burn (last two)

g = g = k = ḳ egg (not SEA), fire, fire #, fish #, green,  
knee, long, food (not 1st), one # (not  
SEA), red (not SWA), round, white #,  
woman (not SWA), two # (not SEA)

**Voiceless, voiced, aspirated, and glottalized affricates:**

č	= č <sup>h</sup>	= č <sup>h</sup>	č	dry, eye # (not SEA), four, how?
č <sup>h</sup>	= č <sup>h</sup>	= č <sup>h</sup>	= č	green #, six #
č	= č <sup>h</sup>	= j	= j	water
č <sup>h</sup>	= j	= č	= č̣	louse
	j		č̣	fat (of meat) (SWA + Alnushi)
j	= j	= č	= č̣	fly, white
j	= j	= č	= j	fly
ts <sup>h</sup>	= ts <sup>h</sup>	= ts <sup>h</sup>	= ts	full, sixty # (not SEA)
ts	= ts <sup>h</sup>	= dz	= dz	fish
ts <sup>h</sup>	= ts <sup>h</sup>	= dz	= dz	hand, rain
dz	= dz	= ts	= tṣ	knee, smoke, tree
dz	= dz	= dz	= dz	me #

One clear [b, d, g, j, dz] pattern is evident. (Column, not row)  
Each set has several examples (see above):

b	=	b	=	p	=	p̣
d	=	d	=	t	=	ṭ
g	=	g	=	k	=	ḳ
j	=	j	=	—	=	—̣
dz	=	dz	=	ts	=	tṣ

**THE LOGIC OF ALNUSHI GLOTTALIZATION**

There are number of things to consider when assessing the data from Alnushi Armenian. It is best to simply list them.

1. Glottalization is systematic in Alnushi, according to Bert Vaux who examined Allenoosh's data. Thus it is not a phenomenon of some culture word borrowings. Alnushi has plain voiceless, plain voiced and voiceless glottalized consonants.

2. There are other Armenian 'dialects' with glottalization like Alnushi, according to Vaux. There are perhaps 5 to 10 of them, probably all in Eastern Armenian. Pisowicz also reports explicit glottalization of [p, t, k, ts, č] in Eastern Armenian,

especially in the Ararat area, noting also that at least some glottalization has been confused with aspiration in Armenian, even in Old Armenian.

3. The general question then arises: what is the source of such entrenched glottalization in an Indo-European language? It is *ipso facto* unlikely that some culture word borrowings could cause such a systematic phonological feature because most of the languages affecting recent Armenian have lacked glottalization. Thus Turkic > glottalization, e.g., Turkic in several varieties (including Azeri), Kurdish, Persian, Russian, and in earlier times Greek and Latin.

4. Along those lines the next question is: how old a feature of Armenian are we dealing with? Should much older Armenian be considered the source? At this point the adequacy of the moiety division into Western and Eastern comes up for examination. Did either Proto-Armenian or Old Armenian bifurcate as the terms Western and Eastern could imply? No doubt that there are systematic differences between the two but does that necessarily imply a genetic division into two? Perhaps the bases for the moiety are cultural, geographical or historical, rather than genetic linguistic. The reports of significant differences within Eastern Armenian suggest to this Africanist that the eastern branch has more internal diversity than the western. Moreover, that diversity may also reflect additional branches which are now all lumped together under the term Eastern. What has been most striking to me upon entering the realm of Armenology is general acceptance of 32 'dialects' spread over a large area but no internal taxonomy other than the moiety. It seems akin to the old Semito-Hamitic in which Semitic occupied one moiety and the rest of the family occupied the other, often called Hamitic. Although Greenberg downgraded Semitic to one branch among five, and changed the name to Afroasiatic to reflect that, since then we have determined that one area of old 'Hamitic'—southern Ethiopia—has more deep branches than the whole Near Eastern sector (Egypt + Arabia).

5. What was ancestral Armenian like? Let us suppose that the consensus, or what appears to be the consensus, is right. Modern Eastern Armenian with its aspirated consonants is most like ancestral Armenian, while some of Western Armenian conforms to that model. Then the 'dialects' with glottalization acquired that feature after their descent from ancestral

Armenian, i.e., glottalics are innovations. In turn the innovations were acquired in one of two ways, viz., through internal development by phonological processes or through external borrowings. (I will return to these explanations below.)

6. Strictly speaking, we have not been using the Comparative Method so well in this matter. We need to confront the specifics of the Armenian varieties. If we confront the six stop consonants and four affricates [p/b, t/d, k/g, ts/dz, č/j] of three regular dialects and Alnushi, we find the outcome to be more complex than expected. There are three sets of correspondences: voiced plain versus glottalized, voiceless plain versus voiced plain, and same versus same. The last, however, is more likely to involve nasals, fricatives, and resonants than the stops discussed above; it is most strongly represented in the pronoun data, but it occurs in the numbers too.

7. Fully half of all the stop correspondences, embedded in good etymologies, consist of plain (either voiced in Western [Siegli + SWA] or voiceless in SEA) versus glottalic in Alnushi. But it is not the case that correspondences between Western aspirates and Alnushi ejectives are frequent or important. There are only two ('warm' and 'eye'); the first is from Siegli data not supported by SWA and the second muddled a bit by a plural suffix /k/. So the conclusion cannot be that the glottalized stops of Alnushi represent a massive mishearing of aspirated stops cognate with those found in SEA. Those Eastern counterparts are always plain voiceless stops [p, t, k]. Their Western counterparts are always plain voiced stops [b, d, g] in SWA and almost always the same in Siegli. So even if the Alnushi ejectives were somehow misheard aspirates, they would still be a problem because their pattern is altogether outside of normal Armenian correspondence patterns.

8. What then do the aspirates in Western and Eastern Armenian correspond to in Alnushi? For the most part—plain voiceless stops. Alnushi only has five cases of aspiration correspondence; all of them are on word-final voiceless consonants. Three of them are numbers. The conclusion has to be that aspiration is an unimportant feature in Alnushi, seemingly appearing as a word final release rather like the optional word-final release Americans use for emphasis. Alnushi has one other case of word-final aspiration—on [hiŋg<sup>h</sup>] 'five'—

which is the only case of a voiced aspirate in all four data sets. Its function as a word-final release is strongly confirmed by its appearance in isolation and disappearance in counting.

9. Armenology has established that Western Armenian has lost three stop phonemes still present in Eastern, namely [p, t, k], or has lost the feature plain voicelessness. Thus it is in etymologies<sup>9</sup> that there are no correspondences with SWA [p, t, k], save 'nose' where all four dialects have initial [k-]. Siegli has 26 examples of plain voiceless in etymologies. Even if one suspects that Siegel misheard a number of aspirated stops, this does not explain away the three cases where SWA has [d] or [g] versus Siegli [t], [k] and even [t<sup>h</sup>]. Such a mishearing is less likely, not to mention the nine cases where aspiration was heard in etymologies and five heard in non-cognate cases. The conclusion probably has to be that some Western dialects have not lost plain voicelessness—yet.

10. SEA retains [p, t, k] as well as their aspirates or has kept the feature of plain voicelessness, as well as plain voiced stops. Thus SEA has nine stop phonemes against SWA's six, involved in cognates. This is not to deny that other stop phonemes may be found in the large non-basic lexica of Armenian dialects, particularly embracing loan words from neighboring languages.

11. Alnushi has plain voiceless and voiced [p, t, k], as well as voiceless glottalized [p<sup>ʔ</sup>, t<sup>ʔ</sup>, k<sup>ʔ</sup>], ignoring the few aspirate cases. Thus, as an ostensibly Eastern dialect, Alnushi has nine stop phonemes. What they correspond to in SEA is a surprise: [b, d, and g] match [b, d, and g] nearly exclusively, while both match SWA/Siegli voiceless [p, t, k] whether aspirated or not. These cases are not numerous, the voiced set of Eastern being about as rare as the voiceless of Western. Some 25 etymologies find Eastern/Alnushi voiceless stops, aspirated or not, matching the same in Western. However, the number of etymologies with the glottalic [p<sup>ʔ</sup>, t<sup>ʔ</sup>, k<sup>ʔ</sup>] exceeds that of plain [p, t, k] and [b, d, g] combined. While the Alnushi glottalic set strongly matches the plain voiced sets of Western/Siegli, equally strongly it matches the voiceless sets of SEA. There are no voiced correspondences in SEA to the ejectives of Alnushi.

12. Since Armenology has proposed that the basic Eastern set of nine stops is most like the stop sets of Old Armenian, and

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<sup>9</sup>*Etymologies* is here used in one of its several meanings, to indicate a comparison set, a set of cognates, gathered together for the purpose of finding specific sound correspondences.





glottalized consonants, then we seem to have four choices. First, we may argue that Classical's voiceless series /p, t, k, ts, č/ was indeed glottalized. We might extend glottalization to the voiced stops of PIE, from which the Classical series is derived. Second, we could insist that Alnushi somehow invented the glottalics by itself by some sort of natural phonological process; in effect we could turn the problem over to Bert Vaux and his colleagues in phonological theory. Third, because my informant was educated, sophisticated and literate, her belief that five letters of the Armenian alphabet were glottalized consonants—wherever she got that notion from—was possibly the basis of her glottalizing so much of the data she gave me. She wanted to be very sure that I got it right. Ergo we have a sociolinguistic explanation. Fourth, we might consider the influence of Kartvelian or Caucasian languages on this section of Armenian, i.e., post-Classical but before 1900 AD, when the large migration to the USA began.

Considering the last alternative first, Alnushi appears most associated with the area between Lakes Sevan and Urmia, focused along the Arak river. More recent contacts would have been with Turkic and Kurdish, before that mostly with other members of the Iranian branch of Indo-European. Since the area was part of the Urartian realm in the last millennium BC, mapped by Zimansky (1985), Urartian probably influenced Armenian during the pre-Classical period. That may or may not have been an East Caucasian glottalizing influence, given the opposition by some scholars to Hurro-Urartian's relationship to East Caucasian. However, the continuing presence of Kartvelian not far to the north adds strength to a borrowing theory.

The third alternative cannot be answered definitely. However, the likelihood is that Alenoosh Stepanians learned her Armenian, or her belief that certain consonants were glottalized, from her parents. The Armenian schools of Watertown are said to teach SWA or SEA with the 'normal' aspirates, so it is possible her parents took special pains to teach her the habits of their dialect in clear contrast to the usual standard Armenian. It is possible that intensive research in Watertown would show the Stepanians were the only speakers of that dialect!

The second alternative surely would not be beyond the abilities or imaginations of current phonological theorists. However, careful perusal of a small part of the scientific

literature on Armenian shows little attention to the origins of glottalics. Vaux (1998), my most valuable source, doesn't mention glottalization, nor does Greppin (1986). I found only Pisowicz (1998) available in English for some opinion on the question. My key question is: can glottalized consonants arise from a series of plain ones? Vaux thought that they could. My second question is: where then has this occurred?—especially since we do have a number of cases in Afroasiatic where plain consonants have arisen from a glottalized series.<sup>10</sup>

The first alternative seems outrageous. The standard version of the stop consonants and affricates of Classical Armenian seems well supported. More than that, the standard set appears to be all that people talk about or believe in, with a few exceptions. There is one modification of the first alternative which may offer an escape from the mainstream beliefs. Maybe Alnushi was descended from a sister dialect of Eastern Armenian, but a glottalized one, which adopted Classical as its literary language and eventually altered the pronunciation of five letters to fit its own sound system. It is easy enough to check which letters were altered because none of the standard Armenian letters are glottalized; the altered or different letters are /ts, č, p, t, k/ of standard Armenian script. As in sound correspondences, none of the aspirates were changed. So Alnushi not only corresponded regularly with SEA and Classical—plain voiceless versus glottalic—its letter values for those five instances did too. Is it possible that the Alnushi dialect can be more archaic than the Classical language from which it is supposed to be derived?<sup>11</sup> It would appear that the solution to this problem, as in the case of Sebastia, is to propose

<sup>10</sup>Besides modern Israeli Hebrew which has no emphatics, having been adapted to suit a largely European population, there are Beja and Baiso of Cushitic, Janjero of Omotic, and Mesmes of Ethiopic which have shed all or nearly all indubitably ancestral glottalics. Many Afrasianists follow Dolgopolsky in reckoning that the emphatics of most northern Semitic languages were derived from an ancestral set of glottalized consonants like those commonly found in southern Semitic languages (Modern South Arabian and Ethiopic).

<sup>11</sup>One would think such an oxymoron, yet Vaux (1998: 9-10) shows that some dialects like Sebastia are more archaic (exactly like PIE) than Classical from which Sebastia is derived, or so he argues with respect to coronal stops. Or history can repeat itself at least in phonology. But neither Alnushi nor Sebastia need be direct genetic descendents, even if coexisting with the literary language as the 'low' part of a diglossic scene. Some dialects of Scots are more archaic than any other English dialects with respect to velar fricative [x] and unchanged long vowels, as in /niixt, briixt/.

that two dialects are more archaic in some respects than Classical or Old Armenian.

Pisowicz (1997:5) in discussing consonant shifts reports that "On the other hand the distinctive feature of glottalization is sometimes attributed to the OA series transcribed as < **p, t, k, c, č** >." OA here means Old Armenian. Later, when discussing the deficiencies in dialect descriptions, he says: "According to Arak<sup>h</sup>elyan they are typical of the Armenian language only and may be compared with similar sounds in Georgian. This points obviously to the glottalic pronunciation of the Eastern Armenian affricates /c/, /č/ traditionally presented as just plain. On the other hand, Arak<sup>h</sup>elyan's description suggests that the so-called 'aspirated' affricates /c<sup>h</sup>/, /č<sup>h</sup>/ are, in fact, plain." Still later (p. 217-219) he argues: "I also disagree with Kortland as regards the interpretation of the primitive or secondary character of East Armenian glottalized **p, t, k** = OA /**p, t, k**/. I think they are rather secondary as their frequency in OA was the lowest (...) which points to them as marked members of the existing oppositions. The presence of glottalized consonants in a variant of the Hemšin dialect described by G. Dumézil (1964, p8) as well as, far from the Caucasus, in Zeyt<sup>h</sup>un (Khachaturian 1983, p60; Ačaryan-Kilikia, p22) in words where OA had **b, d, g, j, ğ** (!) also favors viewing all glottalized consonants in Armenian as secondary." As well as expressing his opposition to the Glottalic Theory of PIE, advanced by Gamkrelidze, Pisowicz discusses the glottalized consonants in New Julfa. Vaux (1998:212) lists the New Julfa phonemes with no glottalics, yet voiced + voiceless aspirates.

Pisowicz 's further remarks are also relevant: (p. 220)

On the other hand, affricates seem to be easily compatible with glottalization as may be seen in the variant of the Muslim-Armenian dialect described by G. Dumézil as well as in Zeyt<sup>h</sup>un. Adjarian in his unpublished study on the Cilician dialect writes (p22) that the consonants continuing OA **b, d, g, j, ğ** have, in some parts of Zeyt<sup>h</sup>un, a pronunciation similar to the Caucasian **p, k, t, c, č** (voiceless ejectives are meant here). And this is especially valid for the affricates **c, č** (...).

It is impossible, of course, to dismiss Alnushi glottalization as 'secondary' when its frequency is so high. Alnushi and possibly some other dialects like Sebastia or Meghri or New Julfa

represent ancestral or Proto-Armenian better than Classical Armenian does, at least with respect to having a glottalized sector in its phonology. Either that or we will have to concoct a clever phonology to make the glottalization go away. This has to be my main conclusion. Even as an outsider, an Africanist, I think the case is too strong to be ignored.

If Ur-Armenian had five glottalized consonants which correspond to SEA's and Classical's plain voiceless, then it has to be noted that the regular sound correspondences in the literature make those correspond in turn to PIE's plain voiced set /\*b, \*d, \*g/ at least, precisely the PIE set which Bomhard (1998) and others argue were glottalized in PIE. While I have been a colleague with Bomhard in advocating the Nostratic hypothesis, I have never supported the hypothesis that PIE had glottalized consonants because the argument seemed merely typological and out of tune with the main thrust of Indo-European phonology. The further focusing of the Nostratic hypothesis by Joseph Greenberg, making I-E the western end of a chain of Eurasiatic languages stretching to Eskimo-Aleut, further weakened the Glottalic Theory of I-E. None of the other members of Eurasiatic glottalize any consonants; or, if they do, it is by accident, not cognation.

Nevertheless I now suspect that Bomhard was right, after all!

There does exist another possibility, mentioned in the Abstract and number four of the alternatives (above). Assuming for the moment that Proto-Armenian or its early daughters had five glottalics, then we are not necessarily bound to relate that to PIE. As the probable successor of Anatolian in Turkey, and of Urartian in the Lakes Van-Sevan-Urmia triangle, particularly if Armenian had come over the Caucasus mountains from the north, down from the steppes, it would have had multiple and unavoidable contacts with indigenous speakers of the world's second densest concentration of glottalizing languages.<sup>12</sup> The notion that Armenian borrowed words with glottalization from

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<sup>12</sup>The Caucasus has an intense devotion to glottalization in the northwest (Kabardian, et al) but the northeasterners have usually only one or two glottalized consonants more than Alnushi. But Ethiopia has more than 70 languages with systems like Alnushi. A subset in the southwest is a world center for ingressesives. South African Khoisan exceeds the Caucasus with glottalization + clicking Western North America has a high concentration, both Amerind and Na-Dene, making the Pacific Northwest an area of intensity just about equal to the northwest Caucasus.

those neighbors, but mostly culture words, is a well-established tradition, even if the core of Armenian was not affected by it.

However, suppose that those Armenian words of probable PIE origin, the very family cognates at the core of the language, were also altered phonetically? Could such a thing happen? Has it happened elsewhere?<sup>13</sup> Both answers seem to be: *yes*. It seems obvious that such happened to I-E in India but the literature is too vast and probably controversial for us to take that up. It also happened several times in Southeast Asia where phonological influence is a major topic but the question of "who entered?" is more difficult to answer. It also surely happened in central Africa where Nilo-Saharan entered the rain forest and vicinity, encountering Niger-Congo speakers and adopting phonemes /kp, gb/. But the judging of true family cognates in 'Central Sudanic' is too difficult for the present endeavor.

The best and simplest example is in South Africa where the well-known cases of Xhosa, Zulu, and kindred Bantu entered as conquerors, took Bushman wives, and developed some of the most intense examples of glottalizing and clicking. The comparison is fairly stark because most Bantu languages to the north lack the 'exotic' sounds of West Africa and Northeast Africa; Bantu is usually quite ordinary phonologically. But the southern Bantu took the new sound system right into their core. Without trouble in a few minutes I was able to spot true Bantu family cognates in Zulu and Xhosa which had been 'Khoisanized', including low numbers which are not easily borrowed and for which Bantu cognates elsewhere abounded. Q.E.D.<sup>14</sup>

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<sup>13</sup>Words deep in the core of a language are sometimes borrowed, although this is not really a common occurrence. Richard Diebold points out that one heavily glottalized word 'white' in Alnushi is borrowed from old Iranian *spaēta*, a form apparently absent from modern Kurdish. What we are discussing here are native words, true family cognates, which have been altered phonetically by an alien milieu, but not replaced.

<sup>14</sup>It is noteworthy that Bantu entered and eventually over ran much of East Africa, previously inhabited by Khoisan and Cushitic speakers and more recently arrived Nilotes. As well as Bushmen, they absorbed most of the Cushites who had strong glottalizing and lateralizing systems, yet the Bantu did not modify their ordinary phonologies until they reached the Tana river in eastern Kenya. There they, the Pokomo, did adopt glottalization but very little in core vocabulary. But the Bantu in Kenya borrowed heavily in socio-cultural institutions like age-grading and cattle venerating.

### Afterthought

Armenian's internal diversity seems to be well-known but poorly described or analyzed. Vaux draws on a popular view of 32 dialects and perhaps 120 sub-dialects. Djahukian's classification informs better and is more interesting. He lists 44 dialects, divided into an Eastern and a Western Groupment. The latter has seven sub-groups, while the former has four. Djahukian also studied the dialects en mass, eliminated 100 'features' which developed after the Classical period in the 5th century AD, found 40 useful in classification, and concluded that OA had six main dialects, to wit, Western or Byzantine, Southwestern or Eastern Cilician, Extreme Southwestern or Antiochan, South Central, Southeastern, and Northeastern. "These dialects basically coincide with the major administrative divisions of Armenia and its adjacent areas." It thus appears that Classical was far from monolithic.

Assuming that Spiegli and Alnushi represented the two moieties well enough, I tried a simple 100-word Swadesh list count. It should not be too far off because cognation was quite well-known and primary usages had been established in most cases. The results were very surprising. Common retention was no less than 78 percent, making the level of diversity about the same as that of western Romance, say French versus Spanish. This is just beyond what I would call the threshold of unintelligibility or the dialects have become languages. In terms of time, no matter what formula we use, the separation time between Spiegli and Alnushi does not exceed 1000 years, more like 850 years. Even given the usual reluctance to accept glottochronological dates, hardly anyone could argue that the separation goes back to 500 AD!

Yet few would also deny that French did not clearly split from Spanish until, say, the time of Roland, 1080 AD. So by a little pushing of dates we might get Spiegli and Alnushi separating during 'late Classical' times. Knowing where each is/was located would help too!

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**Introductory Note:** The scarcity of sources here below is due to two things. First, as mentioned above, I am alternately an Africanist and a globalist. Second, to do justice to Armenian studies would require considerable training, not least of which

would be learning both Russian and Armenian scientific/literary languages. Thus I have not done justice to Armenian studies. However, I hope that the remarkable data which Alenoosh Stepanians gave me will stimulate interest among the 'real pros' and that they in turn will do justice to her data.

Much of the delay in getting these data published has been due to negative reactions from Armenologists. After checking the general literature in English which I perceived as denying, even denigrating, glottalics in Armenian, I submitted the primary data to *Armenian Review* whose editor rejected the proposed paper because "it has no theme, makes no point." Bewildered by that statement and having African things to do, I put the paper aside for ten years. I owe a considerable debt to three good scholars who persuaded me to try again. To begin with Alexander Lubotsky (Leiden) assured me that Russian linguists knew about non-trivial glottalization in Armenian. Then A. Richard Diebold (Arizona) encouraged me to submit to this journal because the data might be worth discussing, at least among Indo-Europeanists. Finally, Bert Vaux (Harvard) allowed that the paper *qua* data was worth publishing even if he might disagree with the treatment of that data. A very fair judgment. He is not actually committed to disagreement! His statement (1998:1) on the difficulties facing the anglophone Armenologist is worth repeating:

Nevertheless, Armenian has essentially been ignored by linguists outside Armenia, whereas neighboring languages have played a central role in the development of modern linguistic theory. Kenstowicz (1994), the standard handbook of phonological theory, devotes more than fifty pages to discussion of phenomena found in various Arabic dialects, seventeen pages to Russian, and seven pages to Turkish. On the other hand, there is not a single mention of Armenian in this or any other phonological textbook. This lacuna is primarily due to the fact that the Armenian language has for the most part not been studied by linguists who write in languages other than Armenian and Russian.

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## APPENDIX I

A few verb conjugations, partial though they may be, are given here to facilitate the search for Alnushi's closer relatives. Much of Greppin and Khachaturian (1986) is devoted to comparative morphology, viz., nominal declensions, pronoun sets, and verb conjugations, for each of twenty dialects selected to represent the diversity of Armenian. One of them—Lori—has a pronoun set very similar to Alnushi, as well as some of the verb conjugations. One is referred to the Greppin book for the Lori data. The location of Lori in north Armenia, albeit imprecise, helps some; this 'dialect' does not occur in Djahukian's list. Nor does Vaux mention it. The Alnushi conjugations are, as follows: (Vowel [e] as an allophone of /e/ is rendered by [e].)

'go'	Present Tense	'come'
yes gən-úmm- <sup>ʒ</sup> em	I	yes ga-liis- <sup>ʒ</sup> em
du gən-úmm- <sup>ʒ</sup> es	thou	du ga-liis- <sup>ʒ</sup> es
na gən-úmm- <sup>ʒ</sup> e	he/she	na ga-liis- <sup>ʒ</sup> e
meṅk gən-úmm- <sup>ʒ</sup> eṅk	we	meṅk ga-liis- <sup>ʒ</sup> eṅk
duk <sup>h</sup> gən-um- <sup>ʒ</sup> ek	you (pl)	duk <sup>h</sup> ga-liis- <sup>ʒ</sup> ek
nəraṅk gən-um- <sup>ʒ</sup> en	they	nəraṅk ga-liis- <sup>ʒ</sup> en
Past Tense		
yes gən-ats-i		yes yek <sup>ʔ</sup> a
du gən-ats-iirə		du yek <sup>ʔ</sup> a-r
na gən-áts		na (y)ek <sup>ʔ</sup> a-v
meṅk gən-ats-iinḵ		meṅk yek <sup>ʔ</sup> a-ṅk
duk <sup>h</sup> gən-ats-iik		(no data)
nəraṅk gən-ats-iin		(no data)
Future Tense		
	I	yes k <sup>ʔ</sup> ə-ga-m
	thou	du k <sup>ʔ</sup> ə-ga-s
	he/she	na k <sup>ʔ</sup> ə-ga

**Sentences in SVO and SOOV patterns:**

martə ts <sup>ʔ</sup> ets <sup>ʔ</sup> a-v šun-in	the man hit the dog
šunə k <sup>ʔ</sup> əts <sup>ʔ</sup> a-v mart-un	the dog bit the man
martə šun-in miis t <sup>ʔ</sup> ə-vav	the man gave meat to the dog
miis-ə t <sup>ʔ</sup> ur iindz	give me the meat!
šun-its	from the dog (as in get a disease from a dog)

## APPENDIX II

### Phoenix from the Ashes: Armenia and Urartu

There are several things which point to Armenian as the language and culture which replace Urartian on the spot, in what has traditionally been known as Armenia. Rather than there being a dramatic invasion or peaceful migration, Armenian language and culture seem to have been in Urartu, coexisting within the Urartian empire before its downfall. Presuming that peaceful coexistence was the condition, it becomes more likely that I-E Armenian replaced non-I-E Urartian by social or cultural means. At least there seems to be no archeological evidence of conquest or mass migration. This is strikingly similar to the I-E Mitanni component in Hurrian just south of Urartu. Another implication is that a substantial part of the nascent Armenian populace was in origin Urartian. The natives for the most part learned to speak Proto-Armenian, while enclaves of late Urartian speakers no doubt persisted for some centuries. Lang believes that the Alarodians represent Urartians who retained political (tribal) standing for some time. That some Urartians went to Albania of the Caucasian Isthmus, later to be encountered as East Caucasian speakers, cannot be investigated in this paper. Udi, for example, has old borrowings from Classical Armenian (Schulze-Fürhoff 1994:450) but the dates are in the wrong millennium, while the locations are perfect for contacts.<sup>15</sup>

The dates of the predominant transition from Urartian to

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<sup>15</sup>Lang (1980:166) reports that "The Caucasian Albanians spoke a language which is imperfectly known, since virtually all literary texts have perished, and we depend mostly on inscriptions on stone and pottery sherds. The language was unusually rich in guttural sounds, and was described by Armenian missionaries as 'raucous, coarse and discordant'... The Caucasian Albanians were largely annihilated by the Seljuq Turks, though a few remnants are said to survive in the shape of the modern Udi, who dwell in two villages in the Shakki district." Prior to their demise these Albanians had allied themselves closely with the Armenian Christian church.

Schulze-Fürhoff reports: "Classical Armenian sources tell of a province *Uti*, situated in the kingdom of the *Atvank'* (the third Christian kingdom in Ancient Caucasia, known as 'Albania')... That Udi had a long Christian tradition along with the Armenian church, can be proved with the help of multiple loans from Classical Armenian into Udi. An important clue to a *terminus ante quem* can be seen in the reflex of Old Armenian *t* as *l* in Udi (and not as later *ġ*)." [That *ġ* = a voiced velar fricative to S-F.]

Armenian in the old Urartian kingdom have to rest between 700 and 500 BC. Urartu's last king— Rusa III or Sarduri IV— dates to around 600 BC, with Urartian decreasing rapidly after its political affiliate's demise, while Persian and Greek sources in the 6th and 5th centuries listed Armenia as a part of the Persian empire, presumably without the Urartian language or upper class.

An alternative hypothesis would be that the Persian conquest of eastern Anatolia was the cause of Armenian dominance, i.e., Armenian came in as an I-E group closely affiliated with I-E Iran. That theory has largely been abandoned, if it ever had much strength, since Armenian has been established as distinct from Iranian, having its own branch of I-E. Apparently neither Greek nor Persian sources perceived Armenian as particularly close in language or culture to the Iranians.

But between roughly 500 BC and 500 AD, when Armenian became a written language with its own literature, there is a gap, a mere millennium, during which Armenian might be presumed to be the language of its area. Yet the direct evidence of that seems to be missing, even though purported Armenians were writing about Armenia throughout the period. Alas, they wrote in the lingua franca or imperial languages of that time (e.g., Persian, Aramaic, Greek, Latin, etc.).

Indeed, briefly, in the 1st century BC the great king Tigranes threw off foreign domination and established a kingdom much like the old Urartian realm. For a while Tigranes battled Rome, finally to lose but only after two generations of Armenians had experienced having their own state. While the very name of Tigranes survives to this day, as 'Dikran' in many dialects, there was no writing down of the Armenian language. Even after Christianity was adopted in Armenia in the 4th century AD, becoming a unifying force in Armenian culture, it still took another century before the Armenian alphabet was invented and literature began in Armenian.<sup>16</sup>

When did Proto-Armenian shape up in the Caucasus? Or perhaps it should be called pre-Old Armenian, given the

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<sup>16</sup>Alenoosh also gave me a copy of her Armenian alphabet where particular letters had indeed a glottalic value as she pronounced them. Since I was unable to enter those letters into my text, I will give any reader a copy of her hand-written alphabet, if they will write to me in Gloucester.

remarkable tendency of Armenologists to treat Old Armenian like the proto-language. The evidence briefly reviewed above strongly suggests that around 500 BC in the ashes of old Urartu would be a good time and place for Proto-Armenian to be situated. True, there is no direct linguistic evidence for Armenian in 500 BC; nor is there supposedly any in Tigranes' time, although an occasional Armenian political term would be recorded. They usually were, however, of Iranian origin. So we lack the smoking gun of ancestral Armenian, yet there is some circumstantial evidence worth noting. Let's list it here:

1. The sheer fact of Armenian as a branch of Indo-European. Assuming that it left the I-E homeland, wherever we may locate that, several millennia before the time of Christ, then there must have been some sort of Proto-Armenian en route, heading for the Caucasus, lurking around in central Anatolia, pushing north from Mitanni lands, going along with the Iranian movements, crawling over the Caucasian Ridge, sailing across the Black Sea—somewhere it was moving and forming up. Clear evidence of I-E intrusion from the north plus destruction of native sites around 2000 BC strongly imply Hittite and its kin, or Armenian, or early Iranian, but which one is much harder to determine.

2. Abundant evidence of toponyms of Urartian origin in Armenia (Lang 1980:93). The best examples probably are Urartian "erebuni" for the same place Armenians have called "erevan, yerevan" for centuries and Urartian "tušpa" for their capital city near Van, retained in Armenian as "tosp" for the city of Van in Turkey (Zimansky 1985:78).

3. The sheer fact of a mapped political entity—Urartu the kingdom—preceding traditional Armenia in virtually the same place is strong evidence (Zimansky 1985: *passim*). It is also estimated that old or Greater Armenia occupied a territory about eight times as large (238,400 km<sup>2</sup>) as modern (former Soviet) Armenia (29,800 km<sup>2</sup>) (Toumanoff 1963:136).

4. The existence of two archeological cultures, one in the highlands and one in the valleys, coexistent in primary Armenia in the 1st millennium BC. One seemed to develop Urartu, the state, while the other 'remained silent' but had ties to cultures north of the Caucasus (Lang 1980:74-84). The conclusion seems to be that an Urartian aristocracy ruled the valleys, while I-E pastoralists got the hills. However, Zimansky would reverse those roles, putting Urartians in the hills as the shepherds

(1985:9-17), a situation which Lang would restrict to the 6th century BC. From Lang's discussion it appears that the I-E pastoralists were or became dominant through the practice of transhumance, i.e., summering in the mountain pastures and wintering in the lowlands, much like the modern Bakhtiari of Iran. But Zimansky argues that the severe winters put the pastoralists in winter quarters where they could be controlled by the state.

5. The names Hai-k and Hay-astan, traditional Armenian names for themselves and their country, can be inferred as present in the country called Armenia by Persians and Greeks in the 5th century BC (Toumanoff 1963:I)

6. The presence of a bardic tradition in unwritten Armenian, incorporating the "lore of the ancient bards" in pre-Christian times had been recorded (Toumanoff 1963:105). This is close to an explicit statement that those writing in Iranian nevertheless spoke a different language, Armenian, reflected in the bardic tradition.

7. Strabo observed ethnographically that Armenia had been united and that its language was spoken throughout Armenia in the 1st century BC. Referring to the conquests of kings Artaxias I and Zariadris back around 200 BC, he said "Thanks to their work of unification, all the inhabitants of these various districts today speak the same language" (Lang 1980:126).

8. In sum, there is reasonable evidence to support the proposition that the society which persisted through the Hellenistic period, survived the conflicts between Rome/Byzantium and Iran, and was converted to Christianity, was the same one whose language finally was written down in its own alphabet in 406 AD by St. Maštoc<sup>h</sup> (Mesrop). What we now call Old or Classical Armenian became the dominant literary form of that society.

### EXCURSUS

New data from biological research make it possible to test one of the hypotheses in this paper, to wit, that the Armenians are probably descendants of an older Urartian or Hurro-Urartian population, rather than a European population inserted into the Caucasus in the 2nd millennium BC, eventually to replace the Urartians. Thus, the two major indicators of inheritance,

i.e., the language and its genetic kin plus the gene pool and its external connections, do not lead to the same conclusions. While there is little doubt that Armenian *qua* language is a member of the Indo-European genetic group, what about the people, the Haik themselves?

Long neglected as an area for biogenetic research, the Caucasus is finally receiving attention. Two related forms of modern research are involved. The first is the study of 'blood group' or "Classical" genetic markers and their distributions. Such genes as those in ABO, MNSs, Duffy, and Rhesus systems are now known for some peoples in the Caucasus, along with a small number of others of limited usefulness. The second is the study of the DNA directly, as found nowadays in mitochondrial (mtDNA), Y-chromosome DNA, autosomal DNA, etc. The Classical markers have been published in Cavalli-Sforza, Menozzi, and Piazza (1994), while the newest DNA research on populations of the Caucasus is just now coming out. It is so new that the source has to be listed as Personal Communication because it was reported at a conference in April 1999!

In the Classical groupings, the Armenians can be compared with all those populations around them who have interacted with Armenians in the historical past and with those populations farther away but still relevant. While it seems unnecessary to compare Armenians with Africans or East Asians or Pacific Islanders, since Armenia is clearly in the "Caucasoid Realm," still Cavalli-Sforza and colleagues compared everybody. The first result, of course, is that Armenians are part of the dominant grouping of western Asia, Europe and northern Africa or the "Caucasoid Realm." But the next result is that they are closer to the peoples of the Near East than they are to Europeans. Finally, and most decisive, they are closest of all to the North Caucasian peoples. This is consistent with the hypothesis of Urartian origins.

In the new DNA results, based on the principal coordinates analyses of the "Alu and Line polymorphisms" of Stoneking and colleagues, the above conclusion is supported. With the other peoples of the Caucasus, Anatolia, the Levant, and greater Iran they stand apart from, but close to, the full range of European DNA. The precise populations closest to the Armenians have been determined to be two groups of (North) Caucasians; the Dargwa (of Dagestan), East Caucasian speakers, are closest of all, followed by Kabardians from (North) West Caucasian. Old



neighboring peoples like Azeris (Turkic 'Iranians') and Syrians (Semites) are next closest, in that order. In many ways these relationships put the Armenians at the very core of the Caucasus. Other groups tested, like Cherkess (Circassians) of West Caucasian and Greeks & Turks of Cyprus are farther out, while the Georgians are somewhat more remote than central Europeans (Germans and Hungarians). It is also indicated that the Georgians are not the biological population from which the Armenians are derived, despite geographical proximity, historical contacts, and facile assumptions of borrowed Kartvelian sounds. The Abaz (Abkhaz) are divergent, why remains a mystery. Finally, the Ingush, close relatives of the Chechen, are more remote. With the Chechens they were deported during World War II to Kazakstan, only to return a generation later. Since some of their divergence has been attributed to central Asian influence, their sojourn amongst the Kazaks may be the reason.

Some more needs to be said about these DNA distributions. First, the sampling is only beginning. Just two of the thirty East Caucasian populations were sampled, none of the Iranian groups (Kurds, Tats, Talysh, Ossetes), and one of the eight Altaic. Especially missed were the Udi (née Albanian) and Khinalug of East Caucasian and the Kartvelian mountaineers (Svan). Second, since the particular Alu polymorphisms are autosomal DNA, reflecting regular Mendelian two-sided inheritance, samples of mtDNA (matrilineal) or Y-Chromosomal (patrilineal) should be very revealing. Third, the native peoples of the Caucasus (Caucasic, Kartvelian) show more genetic diversity than Europeans do, yet are their closest kin. This suggests the prehistorical importance of the Caucasus for European and West Asian studies.

The model case for this kind of comparison of the two systems of inheritance, linguistic and biological, is found in the Turks of Anatolia and nearby Turkic peoples to the northeast. It is obvious that, phenotypically, the Turks are part of the "Caucasoid Realm." Yet their linguistic kin in central Asia and the Altai are quite clearly marginal to that realm and more closely related to the so-called "Mongoloid Realm," i.e., East Asians and Amerinds. From the Altai to Turkey the Turkic peoples tend to show a general tendency towards west Asians and away from east Asians. While it is surely not novel to propose that the Turks are older Anatolians who abandoned

their native languages and adopted Turkish, that seems a valid conclusion. From many lines of evidence, especially music, we can see that many Turkic peoples of central Asia were originally Iranian-speakers. Archeologically, central Asia was predominantly Iranian from circa 2500 BC to some centuries after Christ, with pockets such as Tajikistan still remaining today. However, in Sinkiang the Turkic Uighur are genetically 'half' European due to their absorption of an older Tocharian population during the same era.

Finally, if a population can be proposed as a source of Armenian glottalization, most notably the East Caucasic group and quite possibly the ancestral Udi group, still this does not thwart Bomhard's thesis. Theoretically, at least, Proto-Armenian had glottalized consonants of Indo-European origin and those were reinforced in some dialects by Urartian sub-strata while lost in others. This paper cannot address that possibility, but holds the problem to be interesting.

### Relevant New Sources

Cavalli-Sforza, L. Luca, Paolo Menozzi, and Alberto Piazza.

1994 *The History and Geography of Human Genes*. Princeton University Press, Princeton.

Seielstad, Mark.

1999 Personal communication. A team of geneticists from Oxford University is now completing data collection and analysis of Y-Chromosomal data from the Caucasus and parts of central Asia and Siberia.

Stoneking, Mark, S. Sherry, G. Risch, M. Robichaux, P. Deiniger, and M. Bather

1999 Personal Communication. "Alu Insertion Polymorphisms and Human Diversity." (Paper read at the conference on Human Evolution. April 21- April 25, 1999. Cold Spring Harbor Laboratory, Cold Spring Harbor, NY.) We are indebted to Dr. Stephen Sherry of the National Center for Biotechnology Information, National Institutes of Health, for additional calculations and communication.

Stoneking, Mark and Ivane Nasidze

1999 Personal communication. New manuscript on mtDNA variation in the Caucasus nears completion, to be published in future.

*The Journal of Indo-European Studies*