

R.S.P. Beekes

Historical Phonology of Classical Armenian

Preface

When Kortlandt told me that his articles on Armenian would be collected and edited, I suggested that he should add a systematic presentation of the historical phonology, so that it would be easy to find his ideas and to see the coherence. He agreed, on condition that I would write it. After some consideration I accepted. I always saw his articles in manuscript before they were published, and often urged him to add a few words to make them more easily understandable. He almost always denied to do so, pointing out that everything had been said already in the text. Of course he was right, but to read it in the way required is often rather difficult.

The other reason is, of course, that Armenian historical phonology is not really easy, and that the existing introductions are very short and by now some twenty years old. For example the laryngeals, which are now such an important subject, are not treated in them (simply because at that time it was not yet possible to say much about it). Personally, I also found that it is often difficult to find things in the existing introductions. One of my aims, then, was to provide a survey where everything was discussed in a place where one can easily find it. That is e.g. the reason why I added a detailed table of contents. I feel that I have not always succeeded in clearly presenting the issues, simply because the problems are often so complicated.

I have not earlier published on Armenian, and the only aim of my writing this introduction is to give a survey containing Kortlandt's views, whose work has so much contributed to Armenian studies. Only here and there one may find a remark which is my own. I made grateful use of the existing introductions, and of Clackson's excellent recent study, which discusses many problems in a very clear way (though I do not agree with him on all points).

For the sake of the unity of the book, I used Kortlandt's notations, though in some cases I would prefer another one.

I could not have written this without the continuous support of Kortlandt, with whom I discussed many points. Of course, I remain sole responsible for this presentation. It was a great intellectual adventure to go into the details of Armenian historical phonology. My presentation must (also) be seen as a token of my gratitude for Kortlandt's continuing stimulation and friendship in the years we worked in the University of Leiden.

Leiden, september 2001

Robert S.P. Beekes

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1. INTRODUCTION

1.1 Armenian

1.1.1 The earliest Armenians

Traditionally the Armenian alphabet was devised in 406/7. Before that time the history of the country is prehistory, except that it is mentioned by other peoples. The Armenians call themselves *Hay*, pl. *Hayk'*, of which the origin is not known for certain. The etymology by PIE $*potis$ 'mighty, lord' (cf. *bay* 'word' < $*bhH_2tis$) seems impossible, as $h < *p$ was lost before $*o$. In the Hittite archives a land *Hayasa* is mentioned,

which has been assumed to be the source of the name. But in Armenian the *-y-* would probably have been lost. The connection with the name of the people of the Hatti (from which the Hittites got their name) fits Armenian sound laws (assuming that the *H-* of *Hatti* could become *H-* in Armenian). The question is whether the Armenians lived in the land of the Hatti. When they came from the west (and overran the Hittite Empire), they may well have lived for some time west of the Urartian territory. This derivation therefore must be seriously considered. The fact that the name can have developed from *Hatti* can hardly be a coincidence. (It may be noted that the name could have *-y* from *-sy-*; and the *H-* could derive from a *p-* if not followed by *-o-*).

We first find the Armenians in the area of the realm of Urartu. So it seems very probable that the Armenians came into their historical lands when the realm of Urartu collapsed, between 640 and 625; the Armenians may themselves have played a part in the end of the Urartian world. So they could have lived nearby, but we have no means of knowing at what time they came in this direction. It is possible that they came to the area around 1200 BC, when the Hittite Empire disappeared. Nor do we have any historical indication from where they came, from the East or from the West. On very general grounds – comparison with what we know to have happened (the arrival of the Hittites and of the Phrygians) – it is more probable that they came from the West. Herodotus' statement (7.73) that they were Φρυγῶν ἄποικοι ('colonists of the Phrygians') is not very reliable: such statements by classical authors are often wrong, and Herodotus based himself on their equipment. Eudoxos (ap. St. Byz. s.v. Ἀρμενία) says that the Armenians τῇ φωνῇ πολλὰ φρυγίζουσιν; but it is not clear what this exactly means. Still, if the mention of the Phrygians contains a historical element, it may imply that the Armenians once lived near (east of) the Phrygians. A confirmation of their western origin has often been seen in the supposed connection of Armenian with Greek. However, this connection is now severely attacked on good grounds. But there are some indications that point to a connection with Thracian and Albanian – hardly with Phrygian (see below 1.3.3).

We are told that the Medes (under Kuaxares, 625 - 585) beat the Armenians. A little later their land became part of the Persian Empire. The name Armenia, the origin of which also is not exactly known, is first mentioned in Darius' inscription in Bisutun. While the Akkadian version still speaks of Úráštu and the Elamite version (which is older than the Persian) has *Harmin-*, the Old Persian text has *Armīna*. The word for the people (*Arminiya*; Elam. *Harminuya* probably has the Persian suffix

added; *Harminu* 'Armenia' only XPh 16) is derived from the name of the land. It probably is the land where Medes or Elamites first encountered the Armenians. The inscription mentions an Armenian called *Haldita*, which is an Urartian name. His son raises a rebellion against Darius in Babylon! Another Armenian leads an army of Darius against a rebellion in Armenia. So at that time the Armenians were well established in the Persian world.

In the vocabulary Urartian words have been identified. From Iranian, however, a very large number of borrowings have been pointed out. This is no surprise, of course, when Armenian was for so long under the influence of Medes and Persians. The oldest and largest layer, however, comes from Parthian. Geographically this is only to be expected, but it implies that the largest influx dates from after the fall of the Achaemenid Empire. The question whether the oldest Iranian loans predate the Armenian loss of final syllables has been much debated: the question is whether the loanwords have the same stem(vowel) as the original Iranian words.

From later times date the borrowings from Greek and Syrian, which are much more limited in number. Olsen (1999, 857 - 967) notes in the vocabulary of the Bible some 600 Iranian loans against + 125 Greek and 80 Syrian loans. The number of inherited words, i.e. words with an Indo-European etymology, is not large; one estimate gives 700 words; Pokorny has only 437 Armenian words. So there remains a very large amount of words of unknown origin.

Christianity became the state religion in 301. The alphabet was designed in 406 by a monk or missionary called Mastoc' (later Mesrop), who started a Bible translation (from Greek), which was finished in 410. (It was first printed in 1666, in Amsterdam.) The period until 460 is considered the Classical language, the language called *oskedar*, 'the golden language' (a term coined by the Mekhitharist scholars in the XVIIth century). This language was artificially retained in use until the XIXth century. One now distinguishes a 'post-Classical' period (VIth and VIIth century) and a pre-middle Armenian stage (VIIIth - XIth century). Middle Armenian is the period of the XIIth - XVIIth centuries (especially known from Cilicia), after which one speaks of Modern Armenian, which occurs in two forms, Eastern and Western Armenian, and in a number of local dialects.

The proof that Armenian was an independent branch of Indo-European was provided by Hübschmann (1877). His etymology of 1883 is not yet replaced in a European language.

1.1.2 Sources

While we have inscriptions since the fifth century, literary texts are only known from later manuscripts. The oldest manuscript is the Moscow Gospel from 887 (though this is not the best manuscript). Most manuscripts date from the end of the XIIIth century onwards. They, of course, contain younger elements and must be used with care.

The oldest texts, which are used to establish the earliest stage of the language, are first of all the Bible translation; and the 'Against Heresies' (*Etc atandoc*) by Eznik of Kolb. Then the 'Life of Mesrop' by Koriwn, 'The History of Armenia' (*Patmut'wn Hayoc*) by an author with the pseudonym Agathangelos, and the 'History of Armenia' by Moses from Choren. The fragments of old poetry cited by Moses (the 'Songs of Gołtn', *Gott'an ergk*) tell about pre-Christian times but are not archaic linguistically.

1.1.3 Dialects

a) One has wondered if the Classical dialect as we have it shows elements from different dialects. In fact only one thing seems to point to this: the word *t'aršamim* 'dry' beside *t'ařamim* which has exactly the same meaning. The development of **rs* is in all further instances *ř*, and no other explanation of the other form has been found.

Other variants mostly concern the presence versus absence of *h*-, as in (*h*)*arbenal* 'be drunk', from the IE root **serbh*-. The variation may be explained through the development of different ablaut grades, full grades **se/orbh*- losing the **s*- without trace, while the full grade **srelobh*- (and perhaps the zero grade) kept the *h*- longer, before it was lost and the initial *r*- got a prothetic vowel (Kortlandt 1983b, 11 [= this vol., 41]).

Absence versus presence of *h*- from a laryngeal is found e.g. in (*h*)*ayc*' 'inspection'. It is proposed that the forms derive from **H₂eis* > *hay*- versus **H₂ois* > *ay*-. Now, while it is possible that different dialects generalized either the *h*- or its absence in forms of this root, it seems quite probable that we may find hesitation within a single dialect. These cases cannot therefore be used as evidence for different dialects in Classical Armenian.

b) The second question that may be asked is if later material gives information about the early developments of the language which cannot be found in the Classical language. That is, is there later material which does not go back on the Classical language and therefore has reflexes of an older situation? A clear instance is the fact that some dialects have nominative forms in *-n* that go back to the old accusative (like *otn* 'foot' in the Classical language) where a dialect does not have

this *-n* and *vice versa*. Thus, beside Class. *asth* 'star' one dialect has *astelna* which continues **H₂stel-m*. It is clear that this form cannot have been taken from the Classical dialect; it must have been selected at an earlier stage (cf. Kortlandt 1985c, 19-21 [= this vol., 63-65]). Note that we are here concerned with morphology. (Cf. also the word for 'milk' in 8.1.2.)

A quite different fact is that some dialects distinguish between an (initial) voiced *H-* and a voiceless one (*h-*). The voiced *H-* represents PIE *γ-*. The assumption is that the Classical language also had this development at an earlier stage, but here the *H-* was lost. This insight helps clarify details of the Classical language, see 7.2.1d.

The most important contribution from later dialects is the observation that some sounds are glottalized, and the conclusion that this phenomenon is inherited from Proto-Indo-European and reflects the glottalization of the voiced (unaspirated) stops; see 10.1.

c) A different question is whether we can identify the position of the Classical language among other dialects, and so determine its geographical position (which is not a linguistic question). Some facts are difficult to explain. Thus Class. *etbayr* 'brother' stands against *axpar* of all modern dialects. This question has not yet been satisfactorily answered. Of course, it is quite possible that details of a given dialect, e.g. the Classical language, may have been lost everywhere else. This is not an unknown phenomenon in the history of languages. One might think of the position of Mycenaean compared with the dialects known from later times.

The overall conclusion is that the Classical language is one dialect (group), perhaps of a small number of speakers, that there were several dialects (though perhaps differing only on a limited scale), and that the modern dialects may preserve important data for the reconstruction of the oldest history of the language.

1.1.4 The alphabet

The Armenian alphabet was traditionally devised by bishop Mesrop, called Maštoc', in 406/7. The Greek alphabet was apparently a source of inspiration, as the order of the letters of the Greek alphabet is retained, but the shape of the signs can only be derived from it with much difficulty. Also the letters that were added are inserted in unpredictable places: no system has been discovered. For linguistic purposes it is therefore more efficient to follow the order of the Latin alphabet.

The alphabet in the traditional order (the corresponding Greek letters are given before them) is:

α	ա	a	—	ծ	c	—	ջ	ǰ
β	բ	b	κ	կ	k	ρ	ռ	ṙ
γ	գ	g	—	հ	h	σ	ս	s
δ	դ	d	—	ձ	j	—	վ	v
ε	ե	e	λ	լ	l	τ	տ	t
ζ	զ	z	—	ճ	č	—	ր	r
η	է	ē	μ	մ	m	—	ց	c'
—	ը	ə	—	յ	y	υ	ւ	w
θ	թ	t'	ν	ն	n	φ	փ	p'
—	ժ	ž	ξ	չ	š	χ	ք	k'
ι	ի	i	ο	ο	o	—	(ο)	(ō)
—	լ	l	—	շ	č'	—	(ϕ)	(f)
—	խ	x	π	պ	p			

In the twelfth century the sign *ο* was added, transcribed *ō*. This sound was the result of contraction of the older, Classical diphthong *aw*. Cf. *ē*. Also a sign for *f* was added, which only occurs in foreign names.

The Armenian alphabet is almost completely phonemic, i.e. every sign indicates a single phoneme. Only *v* is an allophone of *w*. The phonological status of *ṙ*, *l* and *ə* requires discussion (see 1.1.5). The other exception is that /*u*/ is written with two signs, *ow*. This was taken over from Greek, where *ou* came to indicate /*u*/ in the 6th century B.C. already. In a linguistic context the notation *ow* should no longer be used: it would be awkward to retain the only 'mistake' in the Armenian alphabetic system (which has caused another problem: the use of *v* after *o* if [*ow*], not [*u*], is meant). The value of the signs is given when we discuss the phonemic system.

Earlier some signs were transcribed differently:

ç	was used for	c'
č	"	č'
ṙ	"	ṙ
ê	"	ē
(ô)	"	(ō)

The latter (two) are still sometimes used, presumably because the sign is more readily available.

1.1.5 The phonemic system

The phonemic system can be presented as follows:

stops			
labials	<i>p</i>	<i>p'</i>	<i>b</i>
dentals	<i>t</i>	<i>t'</i>	<i>d</i>
velars	<i>k</i>	<i>k'</i>	<i>g</i>
affricates			
	<i>c</i>	<i>c'</i>	<i>j</i>
	<i>č</i>	<i>č'</i>	<i>ǰ</i>
fricatives	<i>s</i>		<i>z</i>
	<i>š</i>		<i>ž</i>
	<i>x</i>	<i>h</i>	
resonants			
liquids	<i>r</i>	<i>ṙ</i>	
	<i>l</i>	<i>ł</i>	
nasals	<i>n</i>	<i>m</i>	
semivowels	<i>y</i>		<i>w</i>
vowels	<i>i</i>		<i>u</i>
	<i>e</i>	(<i>ə</i>)	<i>o</i>
		<i>a</i>	

There are the following diphthongs: *ay* *ē* *oy*
aw *ew* *iw*

There is a triphthong: *ea*
eay

The value of the above signs will in most cases be clear from their position in the phonemic system. ' indicates aspiration.

Less clear are *ṙ* and *ł*. The *ṙ* was called a 'double *r*' (but it was a simple phoneme); it was strongly rolled (as in Spanish). It occurred before *n*, where *r* is not found. However, the *ṙ* was later generalized in other positions in paradigms; cf. *jeṙn* 'hand', gen. *jeṙin*. Also *r* came before *n* through generalization: *verin* 'upper, supreme', gen. *vernoy*. Thus these sounds are phonemes.

The *ł* is traditionally pronounced as [ɣ]. Probably it was a 'dark', velar *l* in origin. It seems to have been in origin a variant of *l*: *ł* stands especially before consonant while *l* is found in anlaut and after *y*. In other positions, however, there is an opposition between them (*gol* 'heat' : *got* 'thief').

v is an allophone of *w*. It stands in anlaut (also of compounds), cf. *vasn* 'because'. Further it is found after *o*, cf. *hoviw* 'shepherd'; cf. the instr. ending *-aw*, *-iw* with *a*- and *i*-stems but *-ov* with *o*-stems. This is done because *ow* was used for /u/. (So this is only a graphic matter.) The value of *w* is not certain. The traditional pronunciation is [v], but this

may not be old. It could have been a bilabial fricative, or a semivowel.

Armenian did not have geminates. Forms like *errord* 'third', have een *a* between the two *r*'s: [*yerərord*].

The *ē* derives from PIE *ei*, but it is not (distinctively) long, as Armenian does not have an opposition between long and short vowels. Its value is in fact [*ei*].

a. There are several difficulties with this sound, though in practice these are not so serious. – The sound arose through reduction of *i* and *u* in pretonic position, i.e. in all syllables except the last; this sound has phonemic value. However, the sound also occurs automatically between consonants. Here it is of course non-phonemic, but its use was extended in certain morphological categories. Through this development it became phonemic on a much wider scale, but this does not consider us (in a historical discussion).

The second problem is that the sound is not normally indicated in writing. On this point, the writing system is deficient. It is written only initially, before clusters beginning with *m*, *n*, *l*, and in the preposition *ast* 'according, after' (*and* 'after, under, with' agrees with the rule): e.g. *əmpem* 'I drink', *əntir* 'select'. The few of these words that have an etymology point to an original full vowel: *ənderk* 'intestines' - Gr. *ἐντέρα*, *and* - Gr. *ἀντί*, *ast* < **post-*, *əlj-am* 'to long for' beside *ilj* 'desire'. So here we have a normal vowel that was reduced in pretonic position; the *a* is a phoneme here. It is unknown why *a* is written (only) here. Only rarely is *a* written in other positions; see 13.3.

Thus, we do not know with certainty where else *a* occurs in the Classical language. The general assumption is that it occurred in the same places as in modern Armenian. In many cases the sound is automatic. The main rules seem to be: an (every) initial cluster has the vowel between the first and the second consonant (*grem* 'write' [*gərem*]), except before word initial *s* + consonant (*spitak* 'white' [*əspitak*]). Further rules, which are not the result of historical events, do not concern us.

That this system existed in Classical Armenian already can sometimes be demonstrated. One is the rendering of Armenian names in other languages. Further, monosyllabic aorist forms got the augment, so *kli* 'I swallowed' was [*kəli*], *span* 'he killed' was [*əspan*], otherwise they would have got *e-*.

In some cases one cannot be sure, if one has a written text only. Thus, we have *stanam* [*astanam*] but *stoy*, the genitive of *sut* 'lie', is pronounced [*səto*] (that the final *-y* is not pronounced is irrelevant here). If the etymology is unknown, and if the word does no longer exist in modern Armenian, there is a problem. It is, of course, a problem of

spelling, not a problem of the language.

1.1.6 Modern pronunciation

Details of the pronunciation are not known. We have rules which are mostly followed also for Classical Armenian, but these date from the 11th or 12th century, and some of them are not valid for the Classical language.

The pronunciation of initial *y*- as [h] is not old.

Word-initial *e*- is pronounced [ye], but this is post-Classical.

The same holds for the pronunciation [wo] for *o*-.

oy before consonant is pronounced [uy]; this may be not Classical.

iw is pronounced as [yu]. No doubt the old pronunciation was [iu]. –

The manuscripts sometimes write *ew*.

ea is pronounced as [ya]; this is easily understood as a later development. The notation *ea* was no doubt used because it *was* a diphthong *ea*.

1.2 Indo-European

1.2.1 The phonemic system of Proto-Indo-European

The phonemic system of Proto-Indo-European has been reconstructed as follows:

labials	<i>p</i>	<i>b</i>	<i>bh</i>
dentals	<i>t</i>	<i>d</i>	<i>dh</i>
palatals	<i>k</i>	<i>ǵ</i>	<i>ǵh</i>
velars	(<i>k</i>)	<i>g</i>	<i>gh</i>
labiovelars	<i>k^w</i>	<i>g^w</i>	<i>g^wh</i>
sibilant	<i>s</i>		
laryngeals	<i>H₁</i>	<i>H₂</i>	<i>H₃</i>
liquids	<i>r</i>	<i>l</i>	
nasals	<i>m</i>	<i>n</i>	
semivowels	<i>i</i>	<i>u</i>	
vowels	<i>e</i>	<i>o</i>	
	<i>ē</i>	<i>ō</i>	

The resonants have consonantal and vocalic allophones; the latter are indicated as *r̥ l̥ m̥ n̥* in the case of the first four, the consonantal ones of *i u* as *y w*. As the allophones form one phoneme, i.e. as allophones are automatic, it is not necessary to indicate which allophone is under discussion. I therefore shall not indicate the allophones, except when the context requires it. – The resonants are vocalic between consonants.

However, there is a problem when we have two or more consecutive resonants, as each of them can be vocalic or consonantal, depending on the further environment. E.g. /ri/ may be [ri] or [ɾy]. What happens in these cases depends on the language (and the time) concerned. The situation becomes even more difficult if there are adjoining laryngeals, as these can become vowels in certain positions. We are not always sure what happened, but we shall hardly be concerned with these problems here.

1.2.2 Note on the laryngeals

The main facts about the laryngeals can be summarized as follows:

1. PIE had three laryngeals:

H_1 H_2 H_3

Single H , without index, is used to indicate any laryngeal, or when it is not known which laryngeal is concerned. The older notation is ? etc.

2. In Hittite, H_2 , H_3 before $*e$ are represented as h ; before $*o$ they disappear. H_1 always gives zero. The development in Armenian is the same as in Hittite.

3. An adjacent e is coloured to a by H_2 to o by H_3 .

4. $H_1e > e$

$H_2e > a$ (PIE did not have a phoneme a .)

$H_3e > o$

$Ho > o$ (i.e. an o was never changed)

5. $eH_2e > aa$, $eH_2o > ao$ etc.

Both sequences H_2ei and eH_2i resulted in ai :

$eH_2i > ai$

$H_2ei > ai$

In the same way au originated.

PIE did not have diphthongs ai , au .

6. $eH_1C > \bar{e}C$

$eH_2C > \bar{a}C$ (PIE did not have a phoneme a .)

$eH_3C > \bar{o}C$

$oHC > \bar{o}C$

7. iHC , $uHC > \bar{i}C$, $\bar{u}C$ (PIE did not have phonemes \bar{i} , \bar{u} .)

8. $CH_1C > \text{Gr. } CeC$

$CH_2C > \text{Gr. } CaC$

$CH_3C > \text{Gr. } CoC$

In the other languages, the three laryngeals had the same reflex: Ilr. i or zero, Balto-Slavic zero, other languages a or zero. Armenian has a .

9. $H_1/H_2/H_3C > \text{Gr. } e/a/oC-, \text{ Arm. } e/a/oC-, \text{ Phrygian also, other languages zero.}$

10. ṚHC

$\text{ṛ}H_1C > \text{Gr. } rēC$

$\text{ṛ}H_2C > \text{Gr. } rāC$

$\text{ṛ}H_3C > \text{Gr. } rōC$

In the other languages the three laryngeals had the same reflex: Skt. *īr* (*ūr* after labial), Av. *arə*, It.-Cl. *rā*, Gm. *ur*, BS = **r* but with acute accent. Arm. *ara*.

r, l, n, m behave parallel, but $\text{ṚHC} > \text{Iir. } \tilde{a}$.

11. ṚHV

Skt. *ir* (*ur*), Av. *ar*, Arm. *ar*, Gr. *ar*, Gm. *ur*; BS **ir* (**ur*)

r, l, n, m behave parallel but Iir. *an, am*.

12. $pH\ tH\ kH > \text{Skt. } ph(?)\ th\ kh$ (PIE did not have voiceless aspirates.)

$b\ d\ g\ g^w + H > \text{Skt. } bh\ dh\ gh$

1.3 Armenian and Indo-European

1.3.1. From PIE to Armenian; a survey

PIE	Armenian
<i>p</i>	<i>h-</i> , zero; <i>w</i> (<i>h-</i> ; zero anlaut before <i>o</i> ; <i>w</i> after vowel)
<i>b</i>	<i>p</i>
<i>bh</i>	<i>b, w</i> (<i>w</i> between vowels)
<i>t</i>	<i>t, t', d, w, y</i> , zero (<i>t</i> after sibilant; <i>d</i> after <i>R</i> ; <i>w</i> before <i>R</i> and between back-vowels; <i>y</i> between vowels; zero anlaut before consonant; <i>-nt > -n</i>)
<i>d</i>	<i>t</i>
<i>dh</i>	<i>d</i>
<i>k</i>	<i>s, w</i> , zero (<i>w</i> before <i>r</i> ; zero anlaut before consonant)
<i>g</i>	<i>c</i>
<i>gh</i>	<i>j, z</i> (<i>z</i> intervocalic)
<i>k^w</i>	<i>k', g, s</i> , zero (<i>g</i> after <i>R</i> ; <i>s</i> after <i>u</i> ; zero anlaut before consonant)
<i>g^w</i>	<i>k</i>
<i>g^wh</i>	<i>g</i>
<i>k^w g^w g^wh</i>	<i>č' č̣ ĵ, ž</i> before <i>e, ē, i, ī</i> (<i>ž</i> intervocalic)
<i>s</i>	<i>s, h</i> , zero, <i>-k'</i> (<i>s</i> before stops and <i>x</i> ; <i>h-</i> before <i>i</i> ; zero elsewhere)
<i>r</i>	<i>r, ṛ</i> (<i>ṛ</i> before <i>n</i>)
<i>l</i>	<i>l, l̥</i> (<i>l̥</i> before consonant)
<i>n</i>	<i>n</i> , zero (zero before <i>s</i>)
<i>m</i>	<i>m, w</i> , zero (<i>w</i> before <i>n</i> , before/after <i>u</i> ; zero before <i>s</i>)

$\underset{\cdot}{r}$	$\underset{\cdot}{l}$	$\underset{\cdot}{n}$	$\underset{\cdot}{m}$	<i>ar al an am</i>
<i>y</i>				zero, <i>ȝ</i> , <i>y</i> , (<i>h</i>) (<i>ȝ</i> after <i>R</i> ; <i>y</i> after <i>a</i> before <i>R</i> ; <i>h</i> when stressed before <i>i</i>)
<i>w</i>				<i>g</i> , - <i>w</i> , zero (zero before <i>r</i> , before/after <i>u</i>)
$\underset{\cdot}{i}$	$\underset{\cdot}{u}$			$\underset{\cdot}{i}$ $\underset{\cdot}{u}$
<i>e</i>	<i>o</i>			<i>e, i</i> (<i>a</i>) <i>o, u</i> (<i>a</i>) (<i>i, u</i> before nasal; <i>a</i> see the text)
\bar{e}	\bar{o}			$\underset{\cdot}{i}$ $\underset{\cdot}{u}$
<i>ei</i>	<i>oi</i>			\bar{e} \bar{e}
<i>eu</i>	<i>ou</i>			<i>oy oy</i>
(<i>H₂ei</i> <i>H₂eu</i>)				<i>ay aw</i>)
$\bar{e}i$				$\underset{\cdot}{i}$

Laryngeals (*R* = *r, l, n, m*; *W* = *i/y, u/w*; - : no evidence)

<i>H</i> -	<i>HV</i> -	<i>H₂e, H₃e</i> > <i>ha, ho</i> ; otherwise <i>H</i> > zero
	<i>HC</i> -	<i>e/a/oC</i>
	<i>HR</i> -	<i>e/a/oR</i>
	<i>HW</i> -	<i>W</i> -
- <i>H</i>	- <i>VH</i>	\bar{V}
	- <i>CH</i>	- <i>Ca</i> ?
	- <i>RH</i>	-
	- <i>UH</i>	\bar{U}
- <i>VH</i> -	- <i>VHV</i> -	<i>VV</i>
	- <i>VHC</i> -	$\bar{V}C$
	- <i>VHR</i> -	$\bar{V}R$
	- <i>VHW</i> -	$\bar{V}W$
- <i>CH</i> -	- <i>CHV</i> -	<i>kH</i> > <i>x</i>
	- <i>CHC</i> -	<i>CC, CaCC</i>
	- <i>CHR</i> -	-
	- <i>CHW</i>	-
- <i>RH</i> -	- <i>RHV</i> -	<i>aRV</i>
	- <i>RHC</i> -	<i>aRaC</i>
	- <i>RHR</i> -	-
	- <i>RHW</i> -	-
- <i>WH</i> -	- <i>WHV</i> -	-
	- <i>WHC</i> -	$\bar{U}C$
	- <i>WHR</i> -	no special development
	- <i>WHW</i> -	<i>WW</i>
<i>HH</i>		-
<i>HRH</i>		<i>aRa</i>
<i>HWH</i>		-

Clusters

I discuss as clusters groups of consonants that are reflected by one phoneme which is not identical with one of the consonants of the original cluster; but I added **sp*, **st* and **ps* (the first and the last being disputed, the second for the sake of coherence). So I do not treat as a cluster **pn* > *wn* (see on **p*) or **tr-* > *r-* (see on **t*). In case of doubt, I took the group as a cluster.

**rs* > *ṙ*

**sy* > *y* **sw* > *k'* **sr* > *ṙ*

**sp* > *sp* **st* > *st* **sk*, **sk^w*, **sk* > *c'*

ps* > *s-* (pst-* > *st-*), *-p'*

**dhy* > *j* **tw* > *k'* **dw* > *k*

**TK* see text

**ky* > *č'* **kw* > *š*

**ks* > *c'*, *š* **ks*, *k^ws* > *c'*, *š*

stop + laryngeal

**pH* > *p'?* **tH* > *t'?* **kH* > *x*

1.3.2. From Armenian to PIE; a survey

Arm.	<	PIE
<i>a</i>		<i>H₂ H₂e eH₂o</i>
<i>ar al an am</i>		<i>r l ɲ ɲ; r̥H l̥H ɲ̥H ɲ̥H</i> before vowel
<i>ara ala ana ama</i>		<i>r̥H l̥H ɲ̥H ɲ̥H</i> before consonant
<i>ay</i>		<i>H₂ei eH₂i oi</i>
<i>e</i>		<i>e H₁</i>
<i>ē</i>		<i>ei oi</i>
<i>ea</i>		<i>i-a</i>
<i>o</i>		<i>o H₃</i>
<i>oy</i>		<i>eu ou (ē-ō)</i>
<i>i</i>		<i>i iH ē eH₁ e-N</i>
<i>ia</i>		<i>ēsa</i>
<i>u</i>		<i>u uH ō eH₃ oH o-N iw</i> before vowel
<i>b</i>		<i>bh</i>
<i>d</i>		<i>dh (R)t</i>
<i>g</i>		<i>gh (R)k w</i>
<i>j</i>		<i>ǵh</i>
<i>j̣</i>		<i>gh</i> before <i>e, i</i> ; <i>dhy (R)y</i>
<i>p</i>		<i>b</i>
<i>t</i>		<i>d</i>
<i>k</i>		<i>g dw</i>

<i>c</i>	<i>ġ</i>
<i>č</i>	<i>gy dy</i>
<i>pʳ</i>	<i>pH ?</i>
<i>tʳ</i>	<i>t tH ?</i>
<i>kʳ</i>	<i>k tw sw</i>
<i>cʳ</i>	<i>sk ks</i>
<i>čʳ</i>	<i>(s)ky</i>
<i>h</i>	<i>p</i> (except before <i>o</i>); <i>H₂ H₃</i> before <i>e</i> ; <i>y</i> (before <i>i</i> , stressed)
<i>x</i>	<i>kH</i>
<i>s</i>	<i>ḳ Ns s</i> before <i>t, p</i>
<i>z</i>	<i>ġh</i> intervocalic
<i>š</i>	<i>kw; sk ks</i> (before consonant)
<i>ž</i>	<i>gh</i> before <i>e, i</i> , intervocalic
<i>y</i>	<i>sy</i>
<i>w</i>	<i>bh</i> intervocalic; <i>p</i> before cons.; <i>t</i> before <i>r</i> ; zero before <i>t</i> after <i>e, i</i>
<i>wo</i>	<i>io</i> unstressed
<i>r, l, n, m</i>	<i>r, l, n, m</i>
<i>ř</i>	<i>rs sr; r</i> before <i>n</i>
<i>ł</i>	<i>l</i> before cons.

1.3.3 The position of Armenian

It was always believed that Armenian had a close connection with Greek. This was recently denied by Clackson (1994). He demonstrates that there are no agreements in phonology (basic developments such as **s > h* do not prove anything) or morphology (e.g. the locative in *-oġ* is derived by Kortlandt, 1984a, sections 4 and 5 [this vol., 47f.], from a genitive ending **ios*). There remains the agreement in the vocabulary, which has always been the real argument. Clackson mentions 136 instances, of which he discusses 65 in detail. I agree that several agreements cannot be maintained (words that had **dw-* and have *erk-* in Armenian; see 12.4c) and that several are just retained archaisms (*awr* - ἡμᾶρ 'day'), as may be found between any two Indo-European languages. He retains only three words that occur in Armenian and Greek only (*sin* - κενός 'empty'; *y-awelum* - ὀφέλλω 'increase' and *sut* - ψεύδος (ψεύδομαι) 'lie'; the last hardly IE). In my view there is more: *nawt'i* 'fasting' - Gr. νήφω simply points to **neH₂bh-*; *erastank'* - πρωκτός 'buttocks' can be derived from **preH₂kt-* : **proH₂kt-* (but may be just a retained archaism); on *olb* - ὀλοφύρομαι 'wail' see 11.3.3.2 Most interesting is *siwn* - κίων 'pillar', which has very recently been shown to be Indo-European (Lubotsky-Praust, in Lubotsky's inaugural lecture)

from a word meaning 'shin-bone'. Here we have – what we hardly find anywhere else – a remarkable agreement in meaning found only in these two languages; on the other hand, this may only seem remarkable to us, but be a normal development. For, since it is clear that Greek and Armenian had no phase of common development, we must look for indications that they lived in each other's neighbourhood, through early loans etc. I am unable to produce such instances, but this is most difficult. Both languages seem to have loans from Anatolian/Aegean languages, but this does not mean that they were in close contact. In this perspective I would consider *kamurj* - γέφυρα 'bridge'. The Greek word originally meant 'beam', and the Armenian word has been compared with Hattic *hamuru(twa)* 'beam'. If there are a great number of agreements, this may depend on the large, old and well-studied vocabulary of Greek. I would conclude that a longer period of close contact can neither be demonstrated nor excluded at the present stage.

As to relations with other languages, Kortlandt (1988a) assumed that Armenian shared with Thracian the loss of aspiration in the voiced aspirates (together with Phrygian, Daco-Albanian and Balto-Slavic) and perhaps the devoicing of the voiced stops. With Albanian Kortlandt notes the following agreements (1980a and 1986a): depalatalization of stops before resonants, monophonemicization of the clusters **sw* and **kw*, and the fact that *H₂* and *H₃* before *e* are reflected as *h-*.

This representation of the laryngeals is according to Kortlandt also found in Hittite. Of course, vocalization of initial, preconsonantal laryngeals is also found on a larger scale: Greek, Macedonian, Phrygian and Hittite. The development is an areal feature, which may partly be due to the substratum languages.

In sum, the relation with Greek has become doubtful, for that with Thracian and Albanian some arguments can be adduced.

2. ACCENT

Armenian shows no trace of the Indo-European accent.

In the oldest phase we can reconstruct, the penultimate syllable (the last but one) was stressed. At a certain stage, as a result of this stress the following = last syllable was lost; not only the vowel, but the consonants following the vowel disappeared as well, except *r*, *l*, *n* (note that at this time **-m* had become *-n*), and also *-k' < *-es*, the nominal plural ending. E.g.

hing 'five' < **penk^we*

eber 'he brought' from **ebéret* < PIE **H₂ébheret*

hayr 'father' < **hayir* < **pH₂tér*

A syllabic resonant of PIE first developed into *ar*, *al*, *an*, *am* (the last further to *-an*):

ewt'n 'seven' < **séptan* < **septṛn̥*

Note that the Armenian prothetic vowel was added after these developments:

acc. *eris* 'three' < **trins* (otherwise the *e*- would have received the stress, giving **er[n]s*).

2.1.1. Retained final vowels

The vowel of (what usually is) the final syllable can still be seen if something appeared after that vowel, be it an ending (inflection), a second element of a compound, or a clitic.

Inflection. For the inflection of nouns cf.:

gařn, pl. *garin-k'* 'lamb'

The forms represent **urH₁-ēn* (but the nom. *-n* continues the old accusative), **urH₁-en-es*. In the second form the suffix is preserved because it had the stress, in the first form the suffix disappeared. Note that no two identical forms are concerned here, but only two closely related forms.

tasn 'ten' but *metasan* 'eleven'

Tasn < **dekṛn̥* had **-an* < **-ṛn̥*. The vowel *a* is retained in 'eleven' because this is a derivative with *-i-*; this *-i-* can again be seen in inflected forms, e.g. gen. *metasan-i-c'*. The final consonant *-n* is always preserved.

Compounds.

hing 'five' but *hnge-tasan* 'fifteen'

Here the final *-e* of **penk^{we}* is preserved in the compound, which is lost in the isolated form. (The *-i-* is syncopated before the stress, as is usual; see 2.2.)

č'or-k' 'four' but *čorek'-tasan* 'fourteen'

Here we see the vowel of the ending **-es* reappear in the compound ('four' is a plural form). Note that in this case the final consonant is always preserved.

Difficult is *ewt'n* 'seven' beside *ewt'anasun*. Probably *-ana-* here represents a special development of the PIE ending **-ṛn̥* followed by the (laryngeal) feature of the **d-* of **dkomtH₂* > *-sun*. See 11.3.3.2.

um dat. of *o(v)* 'who?' beside *ume-k'* dat. of *o-k'* 'someone'. The vowel of the dative ending is preserved before the particle *-k'* (which continues **-k^{we}*; see 10.5.4) of the indefinite pronoun. The *-e-* must be the dative ending **-ōi* (cf. Skt. *tásmāi*); Kortlandt 1984a, 102 [this vol., 49]. We find the same in:

urek' 'somewhere', which is the locative of the stem seen in *ok'*

'somebody', gen. *uruk'*. It stands beside *ur* 'where?'.
i-wi-k', instr. of **ik'* 'something', preserves the ending **-bhi* before the
particle *-k'*.

Note that in individual cases the vowel of the ending may live on because of a special development. **suesōr* became **k'el[h]ur*, after which *-eu-* behaved as a diphthong which became Arm. *-oy-*, as did the PIE diphthong **eu*.

2.2 Pretonic vowel reduction and the Armenian vowel alternations

At a later stage, the vowel of a pretonic syllable was reduced. The effects pervade the whole system of the language. The developments are as follows:

stressed	<i>i</i>	<i>u</i>	<i>ē</i>	<i>oy</i>	<i>ea</i>	<i>eay</i>	<i>-iw</i>
pretonic	<i>ə</i>	<i>ə</i>	<i>i</i>	<i>u</i>	<i>e</i>	<i>e-V, i-C</i>	<i>u</i>

Not changed were: *a, e, o; ay, aw, ew* and *-iw-* in inlaut. Initial *i-* and *u-* were restored: *ink'n* 'self', gen. *ink'ean*, *ul* 'kid', gen. *ul-oy*. With monosyllables in *-i, -u* the vowel was restored in hiatus: *ji* 'horse', gen. *ji-oy, ji-a-wor* 'rider'. Vowels before the first pretonic syllable were also restored: *sireal* 'beloved' - gen. *sireloy* (not **sreloy*). As *ē* and *oy* derive from **ei* and **eu* or **ou*, respectively, it seems that the *e* disappeared; the reduction is quite different from that of *-i, -u*. When *-iw* [*iu*] was reduced to *u*, the *i* became *ə*, just like the single *i*, and *aw* became [*u*]. See also 13.3. (Note that *iw* before *l*, which originated later, remained; see 13.9.) The reduction of *ea* and *eay* is again quite different. Examples:

sirt 'heart' - gen. *srt-i*

erkink' 'heaven' - *erknic'*

luc 'yoke' - gen. *lc-oy*

anasun 'animal' - gen. *anasn-oy*

emut aor. 'he entered' - 1 sg. *mt-i*

mēg 'mist, fog' - gen. *migi, migamac* 'misty'

ēš 'donkey' - gen. *iš-oy*

loys 'light' - *lus-oy, lusawor* 'luminous'

ijoyc' aor. 'he let dismount' - 1 sg. *iřuc'-i*

leard 'liver' - *lerd-i*

matean 'book' - gen. *maten-i*

ateam 'I hate' - impf.1 sg. *ate-i*, 1 pl. *ate-ak'*, pres. subj. 1 sg. *ati-c'em*

t'iw 'number' - gen. *t'u-oy*

3. VOWELS

3.1 PIE *e

a) *e > e

*bher-: *berem* 'I bear' - Gr. φέρω, Lat. *ferō*

*meg-H₂-: *mec* 'big' - Gr. μέγας

Words that seem to begin with a vowel had an initial laryngeal and will be discussed with the laryngeals (11.1.1).

b) *e > i before nasal

*penk^{we}: *hing* 'five' - Gr. πέντε, Skt. *pāñca*. This *i* is subject to reduction when the stress was replaced; cf. *hnge-tasan* 'fifteen'. The development *en* > *in*, then, was earlier than the vowel reduction.

*seno-: *hin* 'old'; Skt. *sāna-*, Gr. ἔνος, Lith. *sėnas*.

Note that the *e* which is the reduction of *ea* is no longer subject to this change: *matean* 'book', gen. *maten-i*.

c) *e > a It is only found in the following words.

*dek^m: *tasn* 'ten' - Gr. δέκα, Lat. *decem*, Skt. *dāśa*

*sueks-: *vat'sun* 'sixty'; cf. *vec* 'six' < *sueks

Kortlandt considers the *a* the reduced grade vowel (from cases where it appeared regularly as *shwa secundum*) that replaced zero grade vocalism (1994b). (For *catr* 'laughter' see 11.3.3.1)

3.2 PIE *o

a) *o > o on the conditions see below

*uor^{gom}: *gorc* 'work' - Gr. ἔργον, φέρων

*g^{wo}ui^o-: *kogi* 'butter'; Skt. *gāvya-*, Gr. (ἐννεά)-βοῖος 'of (nine) cows'.

*pod^{-m}: *ot-n* 'foot', from the acc. form; Gr. πόδ-α

*-bhoros-: *-wor* 'carrying'; Skt. *bhará-*, Gr. -φόρος.

Words that seem to begin with a vowel had an initial laryngeal; these will therefore be discussed with the laryngeals (11.1.1).

b) *o > u before nasal

*pont^{-(eH₁-)}: *hun* 'channel, ford'; Lat. *pons*, *pont-is*, OCS *pъtъ*.

*gon^{-u-}: *cunr* 'knee'; Gr. γόνυ, Skt. *jānu*.

c) *o > a in open syllable (in non-final syllable); *o* was preserved: before two consonants, before *w* and when the following syllable had an *o* (Kortlandt 1983b, 10-11 [this vol., 40]). The change *o* > *a* may have preceded development b) (*o > u); see 11.1.2 on *anun* etc.

*polio-: *ali-k'* 'waves, white hair'; Gr. πολιός.

*poku-: *asr* 'fleece', with *-a-* from gen. *asu*; the *-r* was added later; Skt. *pásu* (< *peku), Gr. πόκος.

*-o- in compounds became *-a-*, cf. *t'ag-a-wor* 'king' < *'crown-bearer'. It is possible that *-ā-* was used in this position, but this cannot be proven.

H_3 before consonant was vocalized to $*o$, which often falls under the rules given and so often became a -. E.g.:

$*H_3nōrio-$ > $*onōryo-$ > *anurj* 'dream'.

$*H_3d-$: *ateam* 'to hate', $*od-$; Lat. *odium* 'hatred', *ōdi* (pf.) 'I hate'

For the exceptions cf: $*o$ before w : *kogi* (above), *hoviw* 'shepherd' (< $*Haeui-$), *loganam* 'bathe' (Gr. λούω) $*o$ before another o : *olorm* 'pity', *olok* 'prayer', *olork* 'smooth', *oroj* 'lamb', *oror* 'sea-gull', *holovem* 'roll'.

o before two consonants: *orb*, *ordi*, *orjik*, *ort*, *oskr*, *ost*, *otn*, *gorc*, *mozi* 'calf' (< $*-zz-$), *mořanam* 'forget' (\bar{r} < $*rn$ or $*rs$); also *ozni* 'hedgehog', *orcām* 'vomit' which got this structure only later (< $*ozini$, $*orucām$)

3.3 PIE $*ē$

$*ē > i$

$*kērd$: *sirt* 'heart'; Gr. κῆρ, Skt. *hārdi*-

The forms with long $ē$ due to a laryngeal will be discussed there, 11.3.1.2.

3.4 PIE $*ō$

$*ō > u$

$*dōm$: *tun* 'house'; Gr. δῶ, cf. δῶμα, Skt. *dam-*

$*snōbhri-$: *nurb* 'small'; Olc. *snæfr*.

$*H_3nōr-io-$: *anurj* 'dream'; cf. Gr. ὄνειρος

$*H_1eH_2mōr$: *awr* 'day' (via $*awur$); Gr. ἡμαρ, ἡμέρᾱ. The forms with long $ō$ due to a laryngeal will be discussed with the laryngeals (11.3.1.2).

4. DIPHTHONGS

The PIE e - and o -diphthongs fell together in Armenian, as follows:

$*ei$ and $*oi > *ei > ē$;

$*eu$ and $*ou > *ou > oy$. The first development is very frequent, the latter is not common. Cf. German *eu* = [oi].

4.1 PIE $*ei$

$*ei > ē$, pretonic i

$*dheigh-$: *edēz* 'he heaped up'; Skt. *déh-mi*, Lat. *figō*

$*leigh-$: *lizem* 'to lick'; Gr. λείχω, Skt. *léh-mi*. Note that unstressed Arm. i must derive from $*ei$ (or $*oi$), as PIE $*i$ in unstressed position would have become (unwritten) a .

$*steib-$: *stēp* 'often', *stipem* 'urge'; Gr. στείβω 'tread, stamp on'.

Note that the development still took place when $*y < *t$ was involved:

$*-e-ti$: $-ē$ 3 sg. pres. ind. ending, *berē* < $*bher-e-ti$ (from $*-eyi > *-ey$ with apocope).

4.2 PIE **oi*

a) **oi* > *ē*, pretonic *i*

**dhoiǵh-* : *dēz* 'heap'; Gr. τοῖχος, Goth. *daigs*

**uoid-* : *gitem* 'to know'; Gr. οἶδ-α, Skt. *véd-a*, Goth. *wait*

**uoin-* : *gini* 'wine'; Gr. φοῖνος

b) **oi* > *ay* There are two words which have the reflex *ay*:

**Hoid-* : *ayt* 'cheek', *aytnum* 'to swell'; Gr. οἰδέω 'to swell'

**oiwiā* : *aygi* 'vine'; Gr. οἴη, ὄα 'service-tree', Lat. *ūva* 'grape'

Kortlandt thinks that this development is very old (1980b, 105 [this vol., 32]) and that this is the regular development of **oi-* at the beginning of the word.

4.3 PIE **eu*

**eu* > *oy*, pretonic *u*

**leuk-os* : *loys* 'light' (subst.); Gr. λευκός (adj.)

4.4 PIE **ou*

**ou* > *oy*, pretonic *u*

**bhougos* : *boyc* 'nourishment'; Skt. *bhóga-* 'enjoyment', Lat. *fungor*

One cites *p'oyt* 'zeal'; Gr. σπουδή 'haste', but this comparison is problematic: **sp-* remains *sp-* in Armenian (see 12.2d). (This word may be non-Indo-European.)

Note that the evidence is very meagre (also for **eu*).

4.5 The PIE long diphthongs

I know of only one case of indirect evidence of a PIE long diphthong. It is the ending of the dative of the indefinite pronoun *o-k'* 'somboddy':

**io-smōi-k^w[e]* : *ume-k'*; the ending was here retained before the generalizing particle **-k^w[e]* (on which see 10.5.4); cf. 2.1.1 on the retained vowels. Kortlandt 1984a, 102 [this vol., 49].

Kortlandt assumes (ibidem) that *ure-k'* 'somewhere' is a locative in *-oi*, and that all final *i*-diphthongs merged into **-e* before they were apocopated. That the long diphthong was shortened (to **-oi*) is quite probable.

5. THE PROTHETIC VOWEL

Armenian did not tolerate words beginning with *r-*. Proto-Indo-European did not have such words: where it seems to be so, there was a preceding laryngeal. This laryngeal was not recognized because in most languages it was lost without trace. In Armenian it was vocalized, to *e-*,

a-, *o-* resp.; see 11.1.2. This means that in Armenian a prothetic vowel was only added before an *r* that became word-initial secondarily. (Older studies often state that the prothetic vowel arose *even* before secondary initial *r*. This dates from the time when the laryngeal developments had not yet been recognized.) This means that if the etymology of a word shows that the *r-* was (or seemed) initial in PIE already, a laryngeal preceded. As this laryngeal was vocalized in Armenian, a (real) prothetic vowel is impossible, a fact that often is not realized. This is even more clear when a Greek cognate has a vowel from a laryngeal before *r-*. In that case the Armenian vowel must represent the same laryngeal and cannot be the (later) Armenian prothesis; cf. further 11.1.2.

When the prothetic vowel was added the accent could no longer be withdrawn to it: *eris* < **trins* kept the stress on the *i*; it was not withdrawn to the *e* because we would then have got **ers*.

There are three ways in which an *r* could become the initial of a word secondarily:

1. through loss of a preceding (PIE) voiceless stop, **p*, **t*, **k*;
2. through metathesis;
3. through the development **sr-* > *ř-*.

The matter is much more complicated than it appears. Kortlandt assumes that the development of a prothesis was the first step in the development of these forms, followed by the above processes (loss, metathesis and **sr-* > *ř-*). Every step was intended to facilitate the pronunciation and eventual elimination of initial clusters. Thus **atr-* was easier (because of the syllabification), than *tr-*. And **art-* is still easier. When original voiceless stops disappeared, the prothetic vowel did not arise, e.g. **klutos* > *lu*. One also expects metathesis in the case of groups like **dn-*, **dhn-*, **ǵn-*, **ǵl-*, where the stop would have been preserved in principle (unless there were additional rules for these cases). I have not found evidence for such groups.

Ad 1.

**treies* : *erek'* 'three'; Skt. *tráyas*, Gr. *τρεῖς*, Lat. *trēs*.

**k^wrep-* : *erewim* 'appear'; Gr. *πρέπω*. The initial may have been **k^w*, not **p-*, because PIE did not have roots with C1 = C3. **prep-* is also possible

Ad 2.

**drak'-* : *artasu-k'* 'tears'; OHG *trahan*; with metathesis Gr. *δάκρυ*, Goth. *tagr*. See on this difficult word Kortlandt 1985a.

**bhreH₂tēr* : *elbayr* 'brother'; Skt. *bhrátar-*, Gr. *φράτηρ*, Lat. *frāter*. The *t* arose through dissimilation before the following *r*.

More examples can be found in 13.13, where the metathesis is treated.

Ad 3.

**sruti-*: *aṛu* 'brook'; Skt. *srutí-*, Gr. *ρύσις*, OIr. *sruth*.

srou-*: (e*rogem >) *ōrogem* 'irrigate'; Skt. *srāvāmi*, Gr. *ρέω*.

Kortlandt follows Pedersen in assuming that the prothetic vowel was *e-* (which could become *o-*, see the next section), while *a-*, which is limited to nouns, was originally a preposition, identical with Slavic *po* (2001).

6. VOWEL CONTRACTION AND VOWEL ASSIMILATION

6.1 Vowel contraction

When an intermediate consonant disappeared, the vowels were contracted. The consonants that disappeared were **y* and **s*.

Two identical vowels resulted in a long one, which was shortened; note that such a new **e* or **o* resulted in *e*, *o*, not in *i*, *u*.

**treies*: *erek'* 'three';

**bhoso-gʷo-*: *bok* 'barefoot'.

**ni-sisd-*: **nist-im* > *nstim* 'sit down'. Note that this *i* was pretonically reduced to *ə*.

When the vowels were not identical, the phonetic result was never *e* (it so happens that we have only examples in which one vowel was *e*):

e - o > o:

**suesor-es*: *k'or-k'* 'sisters';

**kʷetuores*: **čeyor-ek'* > *čor-k'* 'four'.

e - a > a:

**H₁esH₂r*: **e(h)ar* > *ar-iwn* 'blood' (Kortlandt assumes that the laryngeal was vocalized in this form (1999))

a - e > a

**pH₁ter-es*: **hayer-ek'* > *har-k'* 'fathers'; the *-a-* could be analogical, however.

Note that in **suesr-bhi*: **k'ehrbī* the *h* disappeared before the *r* was vocalized, which gave *k'erb* regularly; cf. *jerb-akal* 'prisoner' from **ǵhesr-bhi*.

Note the following contraction which resulted in a diphthong:

**suesōr*: **k'eur* > *k'oyr*; so **s* > **h* occurred after **ō* > *u* but before **eu* > *oy* (Kortlandt 1980b, stage 10 [this vol., 29]).

Kortlandt 1997 explains *nēr* from earlier (analogical) **neyir*, where *ey* became *ē*, like the PIE diphthong **ei*; but cf. 11.3.2.2 on this form.

6.2 Vowel assimilation

There was vowel assimilation, *e - o > o - o* and *e - u > o - u*:

**srou-*: **eřogem* > *ořogem* 'irrigate'.

**H₁ruǵ-*: **eruc-* > **oruc-* > *orc-am* 'vomit'; Gr. ἐρεύγομαι. On the development of the laryngeal see 11.1.2.

7. SEMIVOWELS

The PIE semivowels are *i* and *u*. They can be syllabic or consonantal. (Note that the apparent long *ī*, *ū* were in fact *iH*, *uH*; they are treated in 11.3.4.)

7.1 The semivowels as vowels

7.1.1 Semivowels as vowels: PIE **i*

**i* > *i*, pretonic *ə* (not written)

On *i-a* > *ea* see 13.1; *-io-* and *iw* 13.3.

**H₁e-uid-et* : *egit* 'he found', 3 sg. aor. *gt-i*; pres. *gtanem*.

**tri-ns* : *eris* 'three' acc. (pl.); Goth. *þrins*

**diu-* : *tiw* 'day'; cf. Skt. *dívā* 'by day'

7.1.2 Semivowels as vowels: PIE **u*

**u* > *u*, pretonic *ə* (not written)

**dhugH₂tēr* : *dustr*, gen. *dster* 'daughter'; Gr. θυγάτηρ, Skt. *duhitār-*, Goth. *dauhtar*

**snušos* : *nu* 'daughter-in-law'; Gr. νύς, Skt. *snušā*, OHG *snur*

**H₂nǵhu-* : *anjuk* 'narrow'; Skt. *aṃhú-*, OCS *qzъkъ*, Goth. *aggwus*, Gr. ἄγγυ-ω

**ues-nu-mi* : *z-genum* 'to dress' (*z-* is a prefix); Gr. ἐννύμι, Skt. *vás-te*

7.2 The semivowels as consonants

7.2.1 PIE **y*

a) **y* > *j* after resonant (*r*, *l*, *n*, *m*) if the preceding vowel is not *a*

**ster-io-*: *sterj* 'sterile'; Gr. στεῖρα, Skt. *starí-* 'barren cow', Lat. *sterilis*, Goth. *stairo*.

**H₃nōr-io-* : *anurj* 'dream'; Gr. ὄνειρον < **oner-io-*.

**muni-* : *munj* 'dumb'; Gr. μύνδος, μυναρός, Skt. *múni-* 'wise man, begeistert', Lat. *mūtus*.

**g^when-io-* : *jñjem* 'wipe clean' < **jñj-*; etym. unknown (not cognate with Gr. θεῖνω, Lith. *geniù*).

b) **aRy-*, *-oRy-* > *-ayR-*, *-oyR-*

If the preceding vowel is *a*, we get *y* before resonant (infection). The development is parallel with that in Greek, where resonant + *y* gives infection after *a* and *o*. In all cases we probably have anticipation of the *y*

(a'ny); if the *y* remains, the infection of the vowel does not develop into a separate phoneme. See also 13.7.

**H₂elio-* > *ayl* 'other'; Gr. ἄλλος, Lat. *alius*, Goth. *aljīs*, OIr. *aile*.

**ǵhwon-i-*: *jayn* 'voice'; OCS *zvонъ* 'sound'.

Layn 'wide' may represent **p_htH₂-n-i-*: > **hlθny-* > **lany-*.

These are the best documented examples. It is probably also found in *p'aylem* 'shine', cf. *p'olp'olin* 'shine, glitter', which has no good etymology.

The development occurred after *a*, but there is also some evidence for it after *o*. This consists only of *boyl* 'company, assembly' beside *bolor* 'all, entire', which has no etymology. The same holds for *t'oyl* (*tal*) '(give) permission', and *n-šoyl* 'light' beside *šoť* 'ray, (flash of) light'. This evidence is rather uncertain. The etymology of *otj* 'whole, sound' is uncertain (**olyo-*?).

See further 13. 7.

c) **y* > zero: word-initially and between vowels

Word initial *y-*

**io-s* : *or* 'who';

The development in anlaut is debated (Kortlandt 1998a). Two words seem to point to *y-* > *l-*: *luc* 'yoke' < **yug-* and *leard* 'liver' if from **yek^wŕ*. However, a development to *l* is phonetically improbable. The words must have been influenced by other words (the first by *lucanem* 'to bind loose?'; the second word provides several difficulties; Germanic also has an *l-*, cf. *liver*; it was supposedly taken from the word for 'fat', **lip-*, cf. Gr. λιπαρός). The *l* is not to be recognized as a regular development.

Arm. *jur* 'water' has been connected with Lith. *jūra* 'sea'. However, the Lithuanian word is usually connected with Skt. *vár(i)*, so its *j-* cannot be original. Also, Arm. *jer* 'you pl.' beside Skt. *yūyām* has been adduced. Kortlandt assumes that the proto-form must have had **yu-* + *e*, in an accusative **ywe* (parallel to **twe* > *k'é*); and that **yw* fell together with (the reflex of) **ǵhw-*.

The etymology of the pronominal stem *o-* points to **y-* (the idea that it represented **k^wo-* cannot be retained, as **k^w* did not disappear) becoming zero as the regular reflex (as e.g. in Greek).

**y* > zero between vowels

**trei-es* : *erek'* 'three'; Skt. *tráyas*, Gr. τρεῖς, Lat. *trēs*.

*-*eġe-*, *āġe-* : denominative suffixes *-em*, *-am*.

the nom. pl. of the *i*-stems **-ei-es* > **-ek'* > *-k'*.

d) **yi-* > stressed *hi-*, and PArm. **hi-* > unstressed (*ə*)-

This is a very complicated matter, also because of problems with the notation; Kortlandt 1998a, 16f. [this vol., 122f.].

It has been observed that the dialects have a (seemingly) secondary *h-* (its history does not concern us here), but further that some dialects have a voiceless *h-* beside a voiced *H-*, noted *h-* and *H-* respectively. This *H-* in some cases continues Class. *y-*, the preposition. It is also found in the interrogative pronoun: *Hu(v)* = *ov* 'who?', *Hum* = *um* dat. 'for whom?', *Hur* = *ur* 'where?'.

Now Kortlandt assumes the following sequence of events. PIE **y-* became *H-*, which was lost in the Classical language (but retained in some dialects) except before *i*; so **yi-* became (**)Hi-*. (Later this *H-* disappeared too: **jenH₂tēr* > **Hin-* > *ən-* > *n-*, in *nēr* 'brother's wife').

Further this **Hi-* became *hi-* (with the 'normal', voiceless *h*) when stressed. This was the case in a monosyllable (other instances are unknown). In this way dat. *him* 'for whom?' is explained. So it is supposed that this form goes back to **yim*. [I think that it continues **esmōi* (recte **Hesmōi*) with the *y-* of *yos* > *ov* 'who?' (the *-v* as yet unexplained) added, but cf. *z-genum* 'dress' < **uesnumi*. The variant *im* may have lost *h-* after preposition.]

The following has nothing to do with **y-*, but may be treated here because the difference between *h-* and *H-* is concerned. Kortlandt assumes that *hi-* (with voiceless *h-*), e.g. from PIE **pi-* (as in *hing* 'five' < **penk^we*; see below on *yisun* 'fifty'), became *Hə-* (with the voiced *h-*) before the stress; the *ə* is the well-known reduction of pretonic *i*. This is perhaps found in *əmpem* 'to drink', if the protoform is correctly reconstructed as **pimb-*; here the *H* again disappears, but the *ə* is retained before a cluster.

The two series of developments may be summarized as follows:

PIE **yi-* > (**)Hi-* > stressed *hi-* (as in *him* < **yim*)

PIE **pi* > *hi-* > pretonic **Hə-* > *ə-* (as in *əmpem*)

It is assumed that in the word *yisun* this **Hə-* became *Hi*, and that this was written *yi-* (because Classical Armenian had no sign for *H*, and as *yi* is phonetically identical to *Hi*). This point is rather difficult, the more so as the preform of *yisun* is uncertain. So the problem is that we have here not only the development of pretonic *h-* (before *i*), but also that of the development of pretonic *i* in this position. Two solutions may be considered. 1) We start from **penk^(w)dkomtH₂* > **hingsun* = **hiṅsun* which became **hiysun* > **Haysun* > *Hisun*. Better is perhaps 2) to start from **penk^wedkomtH₁* > **hingēsun* > **hingisun* = **hiṅisun* > **hiyisun* > *Hisun*.

Even more complicated is the history of the preposition *in*, but this

history lies outside Classical Armenian, so I refer to Kortlandt's article.

e) Clusters with **y*. Consonant + *y* often gives special developments, which are discussed with the clusters in 12. They are: **sy*, **ty*, **dy*, **dhy*; **ky*, **k(w)y*.

7.2.2 PIE **w*

a) **w* > *g* (except when word-final after the apocope)

**worǵ-* : *gorc* 'work'; Gr. ἔργον, MoHG *Werk*.

**woid-* : *gitem* 'know'; Skt. *véda*, Gr. οἶδα.

**wes-* : *z-genum* 'to cloth oneself', from **ues-neu-mi* (*z-* is a prefix); Gr. ἔννυμαι (ἐννῦμι).

**g^wow-iHo-* : *kogi* 'butter'; see b. on 'cow'.

**deH₂i-wer* : *taygr* 'husband's brother'; Skt. *devār-*, Gr. δᾱήρ, Lith. *dieveris*, acc. *dieverį*, OCS *děverb*.

**ǵonw-* : *cung-k'* 'knee-s' (pl.)

On the problem see Kortlandt 1993. Note that *-eu-* probably had become *-ou-* earlier, so that *-eg-* is unknown. I have not found instances of *-ig-*.

It is not certain what happened with *w* before *s*: both *g* and *k* have been proposed:

**H₂eus-s-i* (loc.): *ayg* 'dawn'; the word would derive from an expression like 'at dawn', and *ayg* (which would at the same time explain the absence of *h-* after the preposition); but another derivation from this stem would also be possible.

**H₂eus-*: *aganim* 'pass the night', if this is the correct reconstruction.

**H₂eus-n-*: *akan-ǵ-k'* 'ears', pl. of *un-kn* < **H₂us-n-*. In this case the *h* < *s* would have devoiced the *g* < *ǵ*. This is impossible because it would have resulted in *k'*.

b) **w* > *-w* (written *-v* after *o*) word-finally after vowel

**diu-* : *tiw* 'day'; Skt. *divá* 'by day'

**neH₂w-* : *naw* 'ship'; Skt. *náu-*, Gr. νᾱῦς, Lat. *nāvis*.

**g^wow-* : *kov* 'cow'; Skt. *gāv-*, Gr. βοῦς; see above on *kogi*.

**H₂rew-* : *arew* 'sun'; Skt. *raví-*; the form with *g* in *areg-akn* 'sun', litt. 'sun-spring' with *areg-* < gen. **arewos*, where the *g* was protected by the reflex of the *s*.

The *w* often spread through analogy: *naw-i* etc., deriv. *naw-ak* 'boat'.

c) **w* > *w* (*v*-) in other positions?

This development is assumed for *vařem* 'to kindle', Lith. *virti* 'to cook',

OCS *variti* id. Initial *g-* is so frequent, that the etymology must probably be given up.

Vec 'six' belongs here if from the *s*-less form **ueks* (**sw-* would have given **k'-*). It is explained from a Lindeman form **su(y)eks*, or with *u* introduced from the ordinal **uks-o-* (Kortlandt 1994b). Then **s* became zero, and vocalic *u* before vowel was retained as */w/* (written *v*). Compare for this development: *i ver(oy)* 'upon' from **(s)uperi*. In *albiwr* 'spring' from **bhreH₁ur* > **brēwr* and *aliwr* 'flour' from **H₂leH₁ur* > **alēwr* the *w* is preserved directly before the *r* after the loss of the final syllable. (On the gen. sg. of these forms see the next section, d.)

Siwn 'pillar' (Gr. κίων, Myc. *kiwo* /*kīwōn*/; the word is now shown to be Indo-European) has not preserved the *w*. It developed from the accusative **kiwon-* > **siwun* > **siun* = *siwn* (*u* written *w*). This is confirmed by *jiwn* 'snow', which derives from **ǵhion-* > *jiun* (written *jiwn*).

d) **w* > zero before *r*, before and after *u*

This development can be considered regular before *u* and *r*, as this is phonetically probable.

**neu-ro-* (with *-ro-* replacing *-o-*); *nor* 'new' via **nou-ro-*.

**brewr-os*, the reshaped gen. sg. of *albiwr* 'spring' (see the preceding section) > *alber*; in the same way *aler* from *aliwr*.

This rule was blocked by a preceding consonant (where we find normal *g*):

**deH₂iuēr* > *taygr* 'husband's brother'. (One might also formulate **yw* > *yg*.)

The loss of the *w* in *neard* 'fibre, sinew' from **sneH₁ur_ḡ(-ti-)* is analogical after the (old) oblique cases: **sneH₁-ur-* > **snēwr-*, which lost its *w* just like *alber* (above).

**kiHyon-*: *siwn* 'pillar'; **siwun-* > **siun* = *siwn*. The development is parallel to **ǵhiom-* > **jiun* = *jiwn*, which shows that the *w* in *siwn* does not continue the original **w*.

For the position after *u* compare also *zinuor* 'soldier' < **zinu-wor* 'bearing arms' (*w* < **bh*). Further cp. *aluēs* 'fox', Gr. ἄλωπηξ.

In *inn* 'nine' there was no *w*. The PIE word was **H₂neun*. This became **eneun* > *inn*, with loss of the diphthong *eu* in last syllable (note that the vocalization is a post-PIE phenomenon); Kortlandt p.c. Or **ineun* was replaced by **inun-* from the ordinal **inun-o-*. The form *erkan* 'millstone' did not have *w*, cf. Lith. *girna*: **g^wreH₂-n-* > **gran-*.

e) Clusters with **w*. For the clusters **sw*, **tw*, **dw*, **kw* see 12.

8. RESONANTS

8.1 Syllabic resonants

8.1.1 PIE $*r > ar$

$*prk-sk-$: *harc'-anem* 'ask'; Skt. *pr̥cch-*, Lat. *poscō* < $*porc-scō$, OHG *forskōn*.

$*bhr̥ghu-$: *barj-r* 'high'; Skt. *bṛh-ánt-*, Hitt. *parkus*.

$*sr̥bh-$: *arb-enam* 'drink'; Lat. *sorbeō*, Lith. *surbiù*.

$*H_2rnu-$: *aṛnum* 'take'; Gr. ἄρνυμαι 'win, gain', Av. *arənu-* 'provide'.

$*mrto-$: *mard* 'man'; Skt. *mṛtá-* 'mortal', Gr. βροτός.

8.1.2 PIE $*l > al$

$*glkt-s, -m$ (nom., acc.): $*kalc'$ > dial. *kaxc'* resp. $*kalt'n$ > Class. *kat'n* 'milk'; Gr. γάλα, gen. γάλακτος < $*glakt-$, Lat. *lac, lact-is*. The dialectal form is, of course, post-Classical (Kortlandt 1985c, 22 [this vol., 65]).

8.1.3 PIE $*n > an$

$*n-$: *an-* 'un-'; e.g. *ankin* 'without wife'; Skt. *a(n)-*, Gr. ἄ(v)-, Lat. *in-*, Goth. *un-*.

8.1.4 PIE $*m > am$ Certain examples have final $-m$, which became $-n$.

$*septm$: *ewt'n* 'seven'; Skt. *saptá*, Gr. ἑπτά, Lat. *septem*.

$*dek m$: *tasn* 'ten'; Skt. *dāśa*, Gr. δέκα, Lat. *decem*.

$*pod-m$ (acc.): *otn* 'foot'; Skt. *pād-*, Gr. πόδ-, Lat. *ped-*, OHG *fuoz*.

$*dui-dkmti$: *k'san* 'twenty'; Av. *visaiti*, Gr. Dor. φίκατι, Lat. *vīgintī*.

8.2 Consonantal resonants

8.2.1 PIE $*r$

$*r > r; \bar{r}$ before n

PIE did not have words beginning with $r-$. Words that had $*pr-$, $*tr-$ lost the stop; the remaining $*r-$ got a prothetic vowel ($e-$ or $a-$; see ch. 4). – On $*Hr-$ see 11.1.3. – On $-rs-$ see the next section, 8.2.1.1.

$*H_2(e)rH_3trom$: *arawr* 'plough'; Gr. ἄροτρον, OIr. *arathar*, Olc. *arðr*; Lat. *arātrum*.

$*\acute{g}erH_2-o-$: *cer* 'old man'; Gr. γέρων, Skt. *járant-*.

$*doH_3rom$: *tur* 'gift'; Gr. δῶρον, OCS *darŭ*.

$*dhur-m$: *duīn* 'door' (from the acc. form); Gr. θύρᾱ, Lat. *forēs*, Goth. *daur*.

$*peruti$: *heru* 'last year'; Gr. πέρυσι, Skt. *parút*.

$*preH_2ktos$: *erastank'* 'back, anus'; Gr. πρωκτός.

$*treyes$: *erek'* 'three'; Skt. *tráyas*, Gr. τρεῖς, Lat. *trēs*.

8.2.1.1 Clusters beginning with *r*: see 12.1

8.2.2 PIE **l*

**l* > *l*; *l* before consonant (except **y*)

**leukos* : *loys* 'light' (subst.); Gr. λευκός, Skt. *roká-*.

**lik^w* : *e-lik* 'he left' 3 sg. aor.; *lk'anem* 'leave' pres.; Gr. ἔ-λιπ-ε, Skt. *á-ric-at*, Goth. *leiivan*.

**Hel-en-* : *eln* 'deer (cow)'; Gr. ἔνελος (with metathesis), ἐλλός (< **el-no-*), OCS *jelenъ*.

**meli-* : *metr* 'honey'; Gr. μέλι, Lat. *mel*, Goth. *milip*.

**pleH₁-*, *-to-* : *lnum* 'fill', *li* 'full'; Skt. *prātá-*, Lat. (*com*)*plētus*.

**klutos* : *lu* 'famous'; Gr. κλυτός, Skt. *śrutá-*, Lat. *includus*.

8.2.3 Nasals: PIE **n*

a) **n* > *n*

**nisdos* : *nist* 'position, seat'; Skt. *nīḍá-*, Lat. *nīdus*, Eng. *nest*

**snusós* : *nu* 'daughter-in-law'; Gr. νυός, Skt. *snuṣā-*, Lat. *nurus*, OHG *snur*.

**genH₁os* : *cin* 'birth'; Gr. γένος, Skt. *jānas*, Lat. *genus*.

**H₂nghu-* : *anjuk* 'narrow'; Skt. *anḥú-*, OCS *ozvkn*, Goth. *aggwus*.

**penk^{we}* : *hing* 'five'; Gr. πέντε, Skt. *pāñca*.

b) **n* > zero before *s*; at the end of a word after vowel at an early stage (except in monosyllables: see on *tun* below, 7.2.4).

**meH₁ns-* : *amis* 'month' (from **am-mis* 'month of a year'); Gr. μείς < **mēns*, Lat. *mēnsis*.

**trins* : *eris* acc. (pl.) 'three'; Goth. *þrins*.

It is assumed that *-n*, like *-m*, was lost after a vowel. This explains that the nominative singular of the *n*-stems originally had no *-n* (as in *aljik* 'girl', *manuk* 'child', where the absence of an *-n* in the nominative is otherwise hard to explain. *erēc* 'priest', which is an *u*-stem in the singular and an *n*-stem in the plural, can thus be explained from a nom. sg. *-ō* (without *-n*), nom. pl. *-on-es*. The *-n* which we normally find in the nom. sg. has been restored. The source was the accusative ending *-n̄*, which became *-n*. This is no doubt the reason why root nouns like *otn* 'foot' joined the *n*-stems. – A word final nasal arose (in the language) from the syllabic nasals, **-ŋ*, **-ŋ̄*, which fell together in *-n*. (See also on *-m*.) Kortlandt 1985c.

8.2.4 Nasals: PIE **m*

a) **m* > *m* (except in auslaut, before *s*, and before *n*)

**meH₂tēr* : *mayr* 'mother'; Gr. μάτηρ, μήτηρ, Skt. *mātār-*, Lat. *māter*.

**H₃moighos* : *mēg* 'mist, fog'; Skt. *meghā-*, Gr. ὁμίχλη Lith. *miglà*.

**H₃meigh-* : *mizem* 'urinate'; Skt. *méhati*, Gr. ὀμείχω, Lat. *meiō*. Or are these Iranian loanwords?

**H₁mos* : *im* 'mine'; Gr. ἐμός.

b) **m* > zero before *s*

**H₂omsos* : *us* 'shoulder'; Gr. ὤμος, Skt. *ámsa-*, Goth. *ams*.

**mēmso-* or **memso-* : *mis* 'meat'; Skt. *māṃsám*, OCS *měso*, Goth. *minz*.

c) **m* > *n* word-finally, retained in monosyllables, and before **s* and *j*

**k^weH₂m* : *k'an* 'as'

**dōm* : *tun* 'house'; Skt. *dám-*, Gr. δῶ, δῶμα.

**ghiom-m* (acc.) : *jiwn* 'snow' (through **jiumn*); Gr. χιών, Av. *zyam-*.

**H₁me-* : dat. *inj* 'to me'; from here the *n* was extended to other forms: *inēn*, *inew* (the *m* is preserved in the gen. *im*; the *m* may also have been assimilated to *n* before *s*: acc. loc. of 'I, me' is < **ins* < **im-s*. This process further perhaps in *inč* 'something', *(y)*im-k^wid*, though here the *-n* may have arisen in word final position; this is probable as otherwise the consonant after *n* would have been voiced, giving **inj*).

d) **m* > zero word-finally except in monosyllables (see c. above)

Word-final *-m* fell together with *-n*, but we do not know exactly at what stage. Later it disappeared (probably through a nasalized vowel). The accusatives of the vowel stems **-om*, **-im*, **-um* disappeared entirely, and so fell together with the nominatives (after the **s*, had been removed; see 8.1).

e) **mn* > *wn* after vowel; if an *o* preceded, this became *u* first; not after (old) *u* and in monosyllables.

The process was probably recent as it is still productive: *paštawn* 'worship' comes from *-mn-*, as appears from the GDL. *paštaman*; and the word is an Iranian loan. Also *goč'íwn* 'shouting, cry' from *-imn*, beside GDL *goč'man*.

**-o-mH₁nos* : *-un* (from **-omnos* > **umnos*, verbal adjective).

After *u*, *-mn-* was restored (rather than preserved): *saržumn* 'movement'. In monosyllables *-mn* was also preserved or restored: *himn* 'foundation', *kamn* 'flail'

f) **m* > *w* before (PArm.) **u*

**H₃neH₃mn* : *anun* 'name'; *onōmn* > *anumn* > **anuwn* > *anun*; Skt. *nāma*, Gr. ὄνομα, Lat. *nōmen*.

**H₁eH₂mōr*: *awr* 'day' (< **amur*); Gr. ἡμῆρ, ἡμέρα. This form is also explained with w-epenthesis, **amur* > **a^wmr* > *awr*, parallel to **anir* > *a^wnr* > *ayr* 'man'. However, the rule -*mu*- > -*u*- was probably older than the loss of final syllables.

*-*omom*: in -*uk'* 1 pl. ending of the aor. subj. Kortlandt (1981c, 30 [this vol., 34f.]) assumes that this form became **umu* > **uu* > *u*, after which the plural indication -*k'* < *-*s* was added.

9. PIE *s

9.1 PIE *s

*s = s before *p, t, x* (on *sk* see on clusters 12.2)

and after *n, m* which disappear

> *h*- in anlaut preserved before *i*

> -*k'* word-finally

> zero elsewhere

*s is preserved before *p, t, x* and after *n, m*; it becomes zero in anlaut (but *h*- before *i*), between vowels, and before *l, n, m*; word-finally it became (> *-*h* > *-*χ* >) -*k'*.

a) *s = s before *p, t, x* and after *n, m*, which disappear.

**ster-io*- (?): *sterj* 'sterile'; Gr. στεῖρα, Skt. *starī-*, Lat. *sterilis*, Goth. *stairo*.

**stib*- : *stipem* 'drängen'; Gr. στείβω 'tread, stamp on'.

**H₂stēr* : *astl* 'star'; Gr. ἀστήρ, Skt. *stár-*, Lat. *stēlla*.

**ues-tu*- : *z-gest* 'clothing'; Lat. *vestis*, Goth. *wasti*.

**sprneH₂mi* : *spařnam* 'menace'; Lat. *spērñō*, OIc. *sperna* both 'push away'.

**skH₂el*-? : *sxalem* 'stumble, err'; Skt. *skhalate*.

**trins* ; *eris* acc. 'three'; Goth. *þrins*

**meH₁nsos* : *amis* 'month' via **mēnsos* (from **am-mis* 'month of the year'); Gr. μεῖς, Skt. *mās* < **maas* < **meH₁ns-*, Lat. *mēnsis*.

**H₂omsos* : *us* 'shoulder'; Gr. ὤμος, Skt. *āmsa-*, Goth. *ams*.

**mēmsom* : *mis* 'meat'; Skt. *māṃśam*, OCS *męso*, Goth. *mimz*.

b) *s > *h*- in anlaut before *i*

**sen-*: *hin* 'old'; Skt. *sána-*, Gr. ἔνος, Lith. *sėnas*. Note that the rule of loss of **h* < **s*) operated after *e* > *i* before nasal.

Note that *h*- 'good' (*h-zawr* 'strong' < 'having good force') is probably a loan from Iranian *hu-*.

c) *s > -*k'* word-finally

*-*es* plur. ending: -(*e*)*k'*; the vowel is preserved in č'orek'tasan 'fourteen'.

*-*mes*, -*tes*: -*mk'*, -*yk'* 1, 2 pl. endings.

This development has surprised scholars, but there are other instances where -*h*, -*x* became -*k*(*h*), as in South Polish dialects, Serbo-Croatian and

German dialects.

When the *-k'* came to be used for the nominal plural ending, the accusative sg. was substituted for the nom. sg. In other positions too the reflex of **-s* was removed, as in the gen. sg. in **-os*. The objection that the attributive adjective has a zero ending in the nominative plural, can be removed by assuming that the adjective took pronominal endings, as e.g. in Germanic; this ending disappeared phonetically.

This explanation also accounts for the large number of pluralia tantum in Armenian (Kortlandt 1985c).

d) **s* > zero elsewhere, i.e. in anlaut (except before *i*), between vowels, before *l*, *n*, *m* (on *sr*, *rs* see 9.2 below on clusters)

**septm*: *ewt* 'n 'seven'; Skt. *saptá*, Gr. *ἑπτά*, Lat. *septem*.

**smH-*: *am* 'year'; Skt. *sám-ā*, OIr. *sam*; cf. **smH₂er-*: *amañ-n* 'summer'; OHG *sumar*.

**srbh-*: *arbi* 'I drunk'; Lat. *sorbeō*, Lith. *surbiù*.

**bhoso-*: *bok* 'barefoot' (< **bhoso-g^{wo}-*); Lith. *bāsas*, OCS *bośь*, OHG *bar*.

**suesōr*: *k'oyr* 'sister' < **-e(h)ur*; Skt. *svāsar-*, Lat. *soror*, Goth. *swistar*.

**snusos*: *nu* 'daughter-in-law'; Skt. *snuṣṭá*, Gr. *νύος*, Lat. *nurus*, OHG *snur*.

**smiH₂-*: *mi* 'one'; Gr. *μία*; cf. Lat. *sem-el* 'one'.

**H₁esmi*: *em* 'I am'; Skt. *ásmi*, Gr. *ἐμί*, OCS *jesmь*.

**io-sm-*: *-um* pron. dat.-loc.; Skt. *-smai*, Goth. (*þa*)-*mma*.

**ues-nom*: *gin* 'price'; Skt. *vasnám*, Lat. *vēnum*. The reconstruction **uēšnom* is improbable; see the following

**ues-nu-*: *z-genum* 'clothe oneself'; Skt. *vas-*, Gr. *ἔννυμι*. As appears from the preceding two etyma, the development *sN* > *N* preceded *eN* > *iN*, *oN* > *uN*, so in *z-genum* the vowel must have been restored.

9.2 Clusters beginning with **s* see 12.2.

10. STOPS

10.1 The Armenian consonant shift.

For PIE we reconstruct (with the dentals as example for the stops):

**t* **d* **dh* which are represented in Armenian as:

t' *t* *d* The second column, the PIE 'voiced stops' were in fact glottalized. Their voice was not the essential factor, but they must have been – phonetically – lenes: the glottalization was the phonemically distinguishing feature. Now this glottalization has been preserved in Armenian up to the present day, as in Latvian (Kortlandt 1978a; 1998c; also 1988a).

The consonant shift consisted in the following developments: 1)

weakening of the plain, voiceless stops; 2) devoicing of the 'voiced', glottalized stops; 3) loss of aspiration in the aspirated stops. The relative chronology of these changes in Armenian according to Kortlandt was as follows:

- a) loss of aspiration (of the aspirated stops); stage 1;
- b) devoicing of the glottalized stops;
- c) voicing of plain, voiceless stops after resonant;
- d) lenition of the plain, voiceless stops: $*p \ *t \ *k > *ϕ \ *θ \ *χ$ (stage 10);
- e) 'shortening' of these fricatives to $p' \ t' \ k'$ (stage 19).

10.2 The labials

10.2.1 PIE $*p$

- a) $*p > h$ - in anlaut before vowel ($>$ zero before o)
- b) $>$ zero in anlaut before o
in anlaut before consonant
after nasal
- c) $> w$ elsewhere, i.e. after vowel ($o + w$ before consonant $> u$; $i + w$ before vowel gives u)

- a) $*p > h$ - in anlaut before vowel (except o)

$*pH_2tēr$: *hayr* 'father'; Skt. *pitár*-, Gr. *πατήρ*, Lat. *pater*.

$*penk^we$: *hing* 'five'; Skt. *pāñca*, Gr. *πέντε*, Lat. *quinque*.

$*puHr$:- *hur* 'fire'; Gr. *πῦρ*, Hitt. *pahhur*, Umbr. *pir*, OHG *fiur*.

$*ped-om$: *het* 'trace, foot'; Skt. *padám* 'step', Gr. *πέδον* 'bottom'.

$*peruti$: *heru* 'last year' ($< *heruy$); Skt. *parút*, Gr. *πέρυσι*.

$*pontH$:- *hun* 'road, ford'; Skt. *pánthāḥ*, Gr. *πόντος* 'sea', Lat. *pons*, *pont-is*, OCS *pъtb*. The word must have preserved its h - because the $-o$ - had become $-u$ - (or it comes from the oblique cases with $*pntH$ -).

On $*pi > hi > yi$ see 7.2.1d

- b) $*p >$ zero in anlaut before o ; in anlaut before consonant; after nasal

$*pod-m$ (acc.): *otn* 'foot'; Skt. *pád*-, Gr. *πόδ*-α acc., Lat. *ped-em*, OHG *fuoz*.

$*pōlH$:- *ul* 'kid'; Gr. *πῶλος*; Goth. *fulan* $< *plh$ -.

$*poli$:- *ali-k'* (pl.) 'waves; white hair'; Gr. *πολιός* 'grey', Skt. *pali-tá*- ($< *peli$ -), OHG *falo* ($< *pol-uo$ -). Note that the $*p$ - $> *h$ - here disappeared before o became a .

$*pleH_1$ -tos: *li* 'full'; Skt. *prātá*-, Lat. (com)-*plētus*.

$*preH_2kt-o$:- *erast-an-k'* 'buttocks'; Gr. *πρωκτός* $< *proH_2kto$ -. See 10.3.1.2.

Note the prothetic vowel.

$*pter-om$: *t'er* 'side'; Gr. *πτέρον* 'wing'.

$*ptel$:- *t'eli* 'elm'; Gr. *πελέα*, Lat. *tilia*. These words may be loans from a

Mediterranean language.

**preisk^w-u-*: *erēc* 'elder, priest'; Lat. *prīscus* 'ancient'; Gr. πρέσβυς, Cretan πρεῖγυς (which have **g^w*). Note the prothetic vowel.

**n-pōlH-o-*: *am-ul* 'sterile'; see on *ul* above. The *m* shows that the compound was formed when the *p-* was still there.

**n-putr-io-*: *amuri* 'unmarried' (< *child-less); Skt. *putrá-* 'child', cf. Lat. *puer*. The **p* > **h* was lost after the prefix.

c) **p* > *w* after vowel

**septm*: *ewt'n* 'seven'; Skt. *saptá*, Gr. ἑπτά, Lat. *septem*.

**H₁epi*: *ew* 'and, also'; Skt. *āpi*, Gr. ἐπί.

**suopno-*: *k'un* 'sleep'; Skt. *svápna-*, Lat. *somnus*. Here we have *u* from *o-w*.

**H₂rǵipio-*: *arcui* 'eagle', from **arciwi*; Skt. *rjipyá-*.

**prep-*: *erewim* 'seem'; Gr. πρέπω, OIr. *richt* 'form, shape'. (One also considers a root **k^wrep-*, as in PIE roots the first and the last consonant were seldom identical.)

10.2.2 PIE **b*

**b* > *p* Note that the phoneme **b* was very rare in Proto-Indo-European.

**stib-*: *stipem* 'urge, compel'; Gr. στείβω 'tread, stamp on', στίβαρός 'strong'.

**bi-bH₃-*: *ampem* 'drink' with a nasal infix; other reconstructions are also proposed, but they are not relevant for the **b*.

10.2.3 PIE **bh*

a) **bh* > *b* (when not intervocalic)

b) > *w* between vowels (which disappears after *u*)

a) **bh* > *b* except between vowels

**bher-*: *berem* 'carry'; Skt. *bhar-*, Gr. φέρω, Lat. *ferō*, Goth. *baíra*.

**bheH₂-ni-*: *ban* 'word'; OIc. *bón*; Gr. φωνή < **bhoH₂-neH₂*; the word may have had zero grade, however.

**bhreH₂tēr*: *elbayr* 'brother'; Skt. *bhrátar-*, Gr. φράτηρ, Lat. *frāter*.

**H₃(o)rbh-os*: *orb* 'orphan'; Gr. ὀρφανός, Lat. *orbus*.

**srbh-*: *arbi* 'drink' aor., pres. *arbenam*; Lat. *sorbeō*, Lith. *surbiù*.

**-bhi* instr. pl. ending: *-b* after consonant: *gařam-b* (*gařn* 'lamb').

b) **bh* > *w* between vowels

**H₃bhel-*: *y-awelum* 'increase';

**-bhi* instr. pl. ending: *-w* after vowel: *-aw*, *-iū*, *-ov*;

**-bhor-*: (*t'aga*)*-wor* 'king' (< 'crown-bearer').

10.2.4 Clusters beginning with labial see 12.3.

10.3. Dentals

10.3.1 PIE **t*

- a) **t* > zero in anlaut before consonant
- b) = *t* after (Armenian) sibilant
- c) > *d* after *r, l, n, m*
- d) > zero word-finally after *n* (after the loss of final vowels)
- e) > *t'* elsewhere, except in the following instances:
- f) > *w* before *r, l, n, m*
- g) > *y* between vowels (at a stage before the loss of final vowels)
but *w* between back vowels

- a) **t* > zero in anlaut before consonant

**treies*: *erek* 'three'; Skt. *tráyas*, Gr. *τρεῖς*, Lat. *trēs*.

We have no evidence for other consonants, but **t* hardly ever occurred before other consonants.

- b) **t* = *t* after sibilant (also after a sibilant that first arose in Armenian).

On **st-* see 8.2.

**preH₂kto-*: *erastank'* 'hind' (bodypart); Gr. *πρωκτός* (< **proH₂ktos*).

**dhuǵH₂tēr*: *dustr* 'daughter'; Skt. *duhitár-*, Gr. *θυγάτηρ*, Lith. *duktė*, Goth. *dauhhtar*.

- c) **t* > *d* after *r, l, n, m*

**mr̥tos*: *mard* 'man, human being'; Skt. *mṛtá-*, Gr. *βροτός*.

**bhrti-*: *bard* 'heap'; Skt. *bhṛtí-*, Lat. *fors, fortis*, Goth. *ga-baurþs* 'birth'.

**H₂rtu-*: *ard* 'order'; Skt. *ṛtú-*, Gr. *ἀρτύω* 'arrange, prepare', Lat. *artus* 'joint, limb'.

**H₁entero-*: *ander-k'* 'intestines'; Gr. *ἐντερά*; OIc. *iðr*, OCS *q̃troba*.

**H₂enH₂-teH₂*: (*dr*)-*and* 'door-post, -frame' (*dr-* from **dur-* 'door'); Skt. *ātā-*, Lat. *antae* (pl.), OIc. *qnd* 'front-room'.

- d) **t* > zero word-finally after *n* after the loss of final vowels

**dwi-dkmti*: *k'san* 'twenty'; Av. *vīsaiti*, Gr. Dor. *ῥίκατι*, Lat. *vīgintī*.

**-dkomtH₂*: *-sun* 'decade', e.g. *ut'-sun* 'eighty'; Gr. *-κοντα*, Lat. *-gintā*.

In cases like *dr-and* (see above) the *-d* was restored after the oblique cases, like gen. *drandi* where the *-nd-* was preserved internally.

**H₂enti*: *and* 'towards, in, at etc.'; proclitic for **hand*; Skt. *ánti*, Gr. *ἀντί*, Hitt. *hanti*, Lat. *ante*. The proclisis will be the reason for the maintenance of the *-d* (the word forming a unity with the following word), and also for the disappearance of the *h-*. There was no restoration in:

**pont-(e)H₁-*: *hun* 'ford'; here the *-d* was not restored because in its

archaic inflection both eH_1 and H_1 disappeared (e.h. gen. $*pont-H_1-os > hun$).

e) $*t > t'$ in other positions (not: in anlaut before consonant, before or after resonant, between vowels)

$*trs-$: $t'āramim$ 'with(er)'; Gr. τέρσομαι, Lat. *torreo*, OHG *derren* 'dry up'.

$*septm$: $ewt'n$ 'seven'; Skt. *saptá*, Gr. ἑπτά, Lat. *septem*.

$*H_2outi-$: awt' 'a passing the night'; Gr. ἀύλη 'courtyard', ἰαύω 'pass the night'. Note that after u the dental became t' .

f) $*t > w$ before r, l, n, m

$*pH_2tr-os$ gen. sg.: *hawr* 'of the father'; Gr. πατήρ, Lat. *patris*.

$*H_2rH_3trom$: *arawr* 'plough'; Gr. ἄροτρον, OIr. *arathar*, Olc. *arðr*.

$*H_2lH_1tr-$: *atawr-i* 'female who grinds corn'; Gr. ἄλετρις.

$*gnH_1-tl-$: *cnawt* 'parent'; Gr. γενέτωρ.

g) $*t > y$ between vowels (at a stage before the loss of final vowels) but w between back vowels

$*pH_2tēr$: *hayr* 'father'; Skt. *pitár-*, Gr. πατήρ, Lat. *pater*. The $*t > *θ$ became y at the stage $*haθir$.

$*bhH_2ti-$: *bay* 'word'; Gr. φάσις, φάτις.

$*peruti$: *heru* 'last year' ($-y$ after u disappeared); Skt. *parút*, Gr. πέρυτι / πέρυσι.

$*klutos$: *lu* 'famous'; Skt. *śrutá-*, Gr. κλυτός, Lat. *in-clutus*.

$*-H_2-to$: $-aw$ 3 sg. middle ending. Kortlandt (1991) assumes the same development in *canawt* 'known', from $*gnH_3-tos$ with a secondary suffix $-to-$; see 10.3.3.2.

10.3.2 PIE $*d$

$*d > t$

$*doH_3rom$: *tur* 'gift'; Gr. δῶρον, OCS *darъ*.

$*dōm$: *tun* 'house'; Skt. *dám-*, Gr. δῶ(μα), δόμος, Lat. *domus*.

$*deH_2iuēr$: *taygr* 'husband's brother'; Skt. *devár-*, Gr. δᾱήρ, Lith. *dieveris*.

$*pod-m$: *otn* 'foot'; Skt. *pád-*, Gr. πόδ-, Lat. *ped-*.

$*ped-om$: *het* 'trace, trail?'; Skt. *padám*, Gr. πέδον.

$*kērd$: *sirt* 'heart'; Gr. κῆρ, κραδίη, Lat. *cor, cordis*, Goth. *hairto*.

$*H_3(o)sd-os$: *ost* 'branch'; Gr. ὄζος, Goth. *asts*.

10.3.3 PIE $*dh$

$*dh > d$

$*dhur-$: *dur-k'* 'gate'; Gr. θύρᾱ, Lith. *dur-*, Goth. *daúr*.

$*dhuḡH_2-tēr$: *dustr* 'daughter'; Gr. θυγάτηρ, Lith. *duktė*, Goth. *dauhtar*.

$*dhoiḡh-$: *dēz* 'heap'; Gr. τοῖχος, Goth. *daigs*.

$*dhlH_1ros$: *dalar* 'green; fresh'; Gr. θαλερός.

10.3.4 Clusters beginning with dental: see 12.4

10.4 Palatals

10.4.1 PIE **k*

- a) **k* > zero in anlaut before resonant (only attested before *l*)
- b) > *w* in inlaut before *r*
- c) > *s* elsewhere

- a) **k* > zero (in anlaut before resonant; only attested before *l*)

**klutos*: *lu* 'famous'; Skt. *śrutá-*, Gr. κλυτός, Lat. *in-clutus*.

A problem gives *srun-k* 'shin-bone'. Kortlandt 1985b follows Pedersen in positing **kērun-*. I wonder whether it is not a loan from Iranian, cf. Av. *sraoni-* 'buttocks' in spite of the difference in meaning; such shifts are not impossible in the case of body-parts; cf. Eng. *ham*.

- b) **k* > *w* in inlaut before *r*

**smV kru-*: *mawru-k* 'beard'; Skt. *śmáśru-*, Lith. *smākras*. There is discussion on the vowel: dial. *miruk* may be the form with **e* (-*ew-* > -*iw-* > -*i-*), the *a* being a reduced vowel in the zero grade.

- c) **k* > *s*

**kērd*: *sirt* 'heart'; Gr. κῆρ, καρδίη, Lat. *cor, cordis*, Lith. *širdis*.

**kiHuōn*: *siwn* 'pillar'; Gr. κίων, Myc. *kiwo* /*kīwōn*/.

**dek m*: *tasn* 'ten'; Skt. *dāśa*, Gr. δέκα, Lith. *dėšimt*, Lat. *decem*.

**komit H₂*: (*ere*)-*sun* '(thir)-ty'; Gr. -κοινά, Lat. -*gintā*; cf. Skt. -*śat*.

10.4.2 PIE **ǵ*

**ǵ* > *c*

**ǵen H₁ os*: *cin* 'birth'; Skt. *jānas*, Gr. γένος, Lat. *genus*.

**ǵonu*: *cunr* 'knee'; Skt. *jānu*, Gr. γόνυ; Lat. *genū*.

**ǵer H₂*:- *cer* 'old'; cf. Skt. *jārant-*, Gr. γέρον, Ossetic *zæron d*.

**H₂ ǵes*:- *acem* 'carry'; Lat. *gerō*.

**uorǵom*: *gorc* 'work'; Gr. ἔργον, φέργον, OHG *werc*.

**meǵ H₂*:- *mec* 'big'; Skt. *māh-*, Gr. μέγας, Goth. *mikils*.

**H₂ rǵ*:- *arcat* 'silver'; Av. *ərəzata-*, Lat. *argentum*; cf. Gr. ἄργυρος.

10.4.3 PIE **ǵh*

**ǵh* > *j*; *z* between vowels)

**ǵhesr*:- *jeřn* 'hand'; Hitt. *keššar*, Gr. χεῖρ.

**ǵhiōm*: *jiwn* 'snow'; Av. *zyam-*, Gr. χιών; Lat. *hiems*.

**ǵhim-er*:- *jmeř-n* 'winter'; Skt. *hēman-*, *himá-*, Gr. χειμών, χειμερινός, δύσ-χμος, Hitt. *gimant-*, Lith. *žiemà*, Lat. *hibernus*.

**bhrǵhu-*: *barj-r* 'high'; Skt. *bṛh-ánt-*, Hitt. *parkus*.

**meǵh(s)ri*: *merj* 'near by' (with metathesis); Gr. μέγρι. Kortlandt 1985b, 10 [= this vol., 58] reconstructs the form with an *-s-*, because otherwise the velar would have been depalatalized before *r*. This allows the explanation that the form has arisen from **me* **ǵhsri* 'at hand'.

**meiǵh-*: *miz-em* 'urinate'; Av. *maēza-*, Gr. ομείχω, Lat. *meiō*, *mingō*.

**dhoiǵho-*: *dēz* 'heap'; Gr. τοῖχος, Av. *pairi-daēza-* 'enclosure', Goth. *daigs*.

10.4.4 Depalatalization

It is assumed that before *r* the palatals were depalatalized (Kortlandt 1985b, 10 [= this vol., 58]). This is seen in *mawruk* 'beard' < **smV kru-* (see 10.4.1.) For *merj* 'near' see above.

10.4.5 Clusters beginning with a palatal; see 12.5

10.5 Labiovelars and pure velars

The labiovelars lost their labialization (stage 14; partly already at 12) and so coincided with the pure velars. The existence of pure velars is a hotly debated issue, but in some cases their existence cannot be denied. It is generally admitted that after *u* only pure velars occurred, but in Armenian velars were palatalized after *u* (and then fell together with the PIE palatals). – In the following we shall give examples of pure velars after those with labiovelars. The velars were palatalized before *e*, *i* (see 10.5.4), but often the non-palatalized forms were restored.

10.5.1 PIE **k^w* and **k*

- a) **k^w* > zero in anlaut before consonant
- b) > *g* after resonant (*r*, *l*, *n*, *m*; not all are attested)
- c) > *k'* elsewhere
- d) > *s* after *u*

On the sequence *-nk^w-* see 13.5.

- a) **k^w* > zero in anlaut before consonant

**k^wtwr-*: *k'ar̥-(asun)* 'forty'; see 9.3.4.

**k^wrep-*: *erewim* 'seem'; Gr. πρέπω, if one prefers the reconstruction with **k^w* (cf. 10.2.1.c).

- b) **k^w* > *g* after resonant (*r*, *l*, *n*, *m*; not all are attested)

**penk^we*: *hing* 'five'; Skt. *pāñca*, Gr. πέντε, Aeolic πέμπτε. The velar was not palatalized after the nasal.

**H₁erk^wos*: *erg* 'song'; Skt. *arká-*.

* H_2rk :- *argel* 'obstacle'; Gr. ἀρκέω, Lat. *arceō*. (The non-palatalized form was taken from a form with a following *o*, cf. Gr. ἄρκος.)

c) * $k^w > k'$

* k^weH_2m : *k'an* 'as'; Lat. *quam*.

* $leik^w$:- *elik'* aor., *lk'anem* pres. 'leave'; Skt. *ric-*, Gr. λείπω, ἔλιπον, Lat. *linquō*, Goth. *leilvan*. The non-palatalized form was introduced from forms with *o*-vocalism.

* k^we :- *-k'* indefinite particle; Skt. (*kás*)-*ca*, Lat. (*quis*)-*que*, Goth. *-h*. The form may not have been palatalized because it was an enclitic.

**ker*:- *k'erem* 'scratch'.

d) * $k^{(w)} > s$ after *u*

**leukos*: *loys* 'light' (subst.); Skt. *roká-*, Gr. λευκός 'white', Lith. *laũkas*.

As was mentioned above, it is generally assumed that after *u* only a pure velar occurred; so examples with * k^w are not to be expected.

10.5.2 PIE * g^w and * g

* $g^w > k$

* g^wou :- *kou* 'cow'; Skt. *gáv-*, Gr. βοῦς, OIr. *bó*, OHG *kuo*.

* $H_1regwos$: *erek* 'evening'; Skt. *rájas*, Gr. ἔρεβος, Goth. *riqis*.

* g^wH_3ei :- *keam* 'live'; for the reconstruction of the root Kortlandt 1975a, 45 [this vol., 11f.].

* g^wenH_2 : *kin* 'woman' (pl. *kanayk'* < * g^wnH_2-); Skt. *jáni-*, *gná-*, Gr. γυνή, OCS *žena*, OIr. *ben*. The *k*- was introduced from forms with zero grade of the root.

* g^werH_3-o :- *ker* 'food'; Skt. *giráti*, Gr. βι-βρώ-σκω, both with zero grade; Lith. *geriũ*. The velar goes back to a form with *o*-vocalism (which is expected here) and took the vowel from the verb.

* g

On the sequence **-aug-* see 13.6.

10.5.3 PIE * g^wh and * gh

* $g^wh > g$

* g^wh_2 :- *gan-em* 'strike'; perhaps the root was * g^whon- ; Skt. *han-*, Gr. θείνω, φόνος; Lith. *geniũ*.

* $g^{(w)}helgh$:- *getj-k'* (plur.) 'glands'; OCS *žlěza* (< **želza*). The velar is not palatalized; was it taken from the zero grade?

10.5.4 Palatalization of (labio)velars.

Palatalization of (labio)velars has been a point of discussion, as

rather often the non-palatalized form has been restored. However, it is most probable that the palatalization before *e* and *i* was regular and that deviations must be explained by generalization of the non-palatalized form which originated before *o* or in the zero grade before consonant. Palatalization may have been blocked by a preceding nasal, as in *hing* < **penk^we* (Kortlandt 1975a).

The developments may be summarized here; I add the representation of the PIE palatals for comparison:

palatals	* <i>k</i>	* <i>ǵ</i>	* <i>ǵh</i>	Arm.	<i>s</i>	<i>c</i>	<i>j, z</i>	(<i>z</i> intervocalic)
(labio)velars	* <i>k^w</i>	* <i>g^w</i>	* <i>g^wh</i>		<i>k'</i>	<i>k</i>	<i>g</i>	
„	before <i>e, i</i>				<i>č'</i>	<i>č</i>	<i>ǵ, ž</i>	(<i>ž</i> intervocalic)

Before *y* we find the latter development, but the *y* disappears; we shall therefore discuss this development under the clusters (10.5.5). It is known only in the case of the PIE voiceless sound. When the development occurs in the last syllable, which disappeared, it is difficult or impossible to decide whether *i* or *y* followed.

a) PIE **k^w* before *e, i* > *č'*

**k^wetuores*: *č'ork'* 'four'; Skt. *catvāras*, Gr. τέσσαρες, Lat. *quattuor*.

**H₃k^w-iH₁*: *ač'-k'* (plur.) 'eyes'; here we are not sure whether the ending developed to *-ī* or *-īe*; for the latter possibility see below under Clusters.

**k^wid*: *z-in-č'* 'anything'. Other pronouns have *-k'* as generalizing particle, without palatalization; the particle has been identified with **k^we*, as in Lat. *quis-que*, Skt. *kás-ca*. The particle apparently behaved like Lat. *nec* beside *neque*, or *ac* beside *atque*: it was shortened to **-k* (with loss of the *-e*, so that there was no palatalization).

**H₂oiu-k^wid(?)*: *oč'* 'not', but the vocalism presents difficulties; Gr. οὐκ.

**Ing^wh-iH₁*: *lanj-k'* (< **lang-y*, a dual form?) 'breast'; Oic. *lunga* 'lung'. The comparison is attractive, but note that the Armenian form cannot go back to the root **H₁leng^wh*- 'light', from which the word for 'lung' is mostly derived.

Compare also such groups as *p'k'am* 'hiss' - *p'č'em* 'blow, inflate'.

b) PIE **g^w* before *e, i* > *č*

**H₂eug-*: *ačem* 'grow'; Lith. *áugu*, Lat. *augeō*. Note that here the *u*, which palatalizes, was lost very early (stage 2).

**gem-*: *čmlem* 'press, squeeze'; OCS *žeti*.

c) PIE **g^wh* before *e, i* > *ǵ, ž* between vowels

**g^wherm-*: *ǵerm* 'warm'; Gr. θερμός; with *-o-* Skt. *gharmá-*, Lat. *formus*.

**g^whiHsl-*: *jül* 'sinew'; Lith. *gýsla*.

**H₁eghis*: *iž* 'snake'; Skt. *áhi-*, Gr. *ἔχις*. (On **e* > **ei* > *ē*, of which *i-* is the reduced form, see 11.6)

d) **sk* > *š* before *e, i*

This group is mentioned here because of its special character. Note that **sk* > *c'* in other cases; see 12.2f. The conditions of this change have not yet been established with certainty. Cf also on the development of the clusters **ks* and **k^ws* to *š* in 12.5c and 12.5d.

**sked-*: *šert* 'chip'; Gr. (σ)κιδ-νημι, aor. (σ)κεδ-άσαι 'scatter, disperse'. The connections of this root are difficult. The meaning does not agree well with that of the Armenian word. Lith. *kedervà* 'splinter' agrees well, but its root must have been **skedh-* (because of Winter's law). (Kortlandt 1975a, 45 [this vol., 12].)

**skel-*: *šet* 'oblique, aslant'; Gr. σκολιός 'curved, bent', OHG *scelah*.

11. LARYNGEALS

11.1 Word-initial laryngeal

11.1.1 Word-initial laryngeal before vowel, HV-

The discovery that Arm. *h-* in some cases reflects an original laryngeal is perhaps even more important than the recognition that the old 'prothetic vowel' which agrees with the Greek one derives from a laryngeal (on which see the next section, 11.1.2). It was notably Greppin who first argued for this phenomenon.

H₁ disappears, but *H₂* and *H₃* before *e* are represented as *h-* (Kortlandt 1983b and 1984b). It is remarkable that, though Armenian has but a limited number of reliable etymologies, this contribution can to my mind be convincingly demonstrated.

After a few introductory remarks we shall discuss the evidence per laryngeal in the following order:

H₁: before *e*; before *o*; before *C* and *RC*;

H₂: " " "

H₃: " " "

At the end some special problems will be discussed.

Preliminary remarks.

Some preliminary remarks must be made. It is sometimes stated that Arm. *h-* is unreliable, because there are words which occur with and without it. However, this concerns a very small number of words, while the large majority either do have *h-* or not: it is clearly phonemic. It must also be realized that it is precisely the *h-* from laryngeal which gave the

impression that the occurrence was inexplicable. In fact, this has been cited as one of the most hopeless phenomena of Armenian historical linguistics.

It has been pointed out that in Middle Armenian an *h-* is added to words which did not have it earlier. However, this does not concern Classical Armenian, which we discuss here. Moreover, the situation in Middle Armenian is largely clarified.

Further it must be noted that initial *h-* disappears when something comes before it (cf. Eng. *shepherd*). Thus in the case of reduplication; *hototim* 'smell' < **hot-hot-*. Further, after the first member of a compound: *jeřn-at* 'with (his) hand cut off', from *hant-* 'cut'. After *z* and *y* an *h-* also disappears: *zinč* 'what' from the root seen in *him* 'why'; *y-et* 'after' from *het* 'trace'. It is conceivable that sometimes such a form without *h-* was generalized.

When a word occurs with and without an *h-*, it is probable that the form without *h-* arose in this way, or through influence of related forms without *h-* (in the paradigm or outside of it).

Note that PIE did not know a purely vocalic anlaut: every word that seems to begin with a vowel in fact had a preceding laryngeal.

The reflexes, then, are as follows:

$H_1e > e$ $H_1o > o$

$H_2e > ha$ $H_2o > o$

$H_3e > ho$ $H_3o > o$

The picture is much complicated by the fact that pretonic *o* often became *a*. The conditions may be summarized here as follows: *o* became *a* in pretonic syllables, except: 1. before two consonants; 2. before *o* in the next syllable; 3. immediately before *g* (< **γ^w* < **w*). In this way, *ho* could become *ha*. A second, minor complication is that *o* became *u* before nasal, as in *us* 'shoulder' < -*oms-*. Further we have initial **oi-* > *ay-* (which Kortlandt dates very early). Also we find **op* > **ow* > *u*. We also have to reckon with *e* > *i* before nasal, as is found in *inn* 'nine' < **H₁m-*.

It is essential that there was an opposition between H_3e and H_3o . Though the reflexes of the vowels are the same in most languages, the two were distinguished in PIE and they remained so in the early stages of the separate languages. This is demonstrated by the limitation of Brugmann's Law to 'ablauting-*o*', as opposed to 'non-ablauting-*o*', i.e. H_3e . This limitation was already formulated by Brugmann himself (who could not yet state the phenomenon in laryngeal terms) and rediscovered by Lubotsky. E.g. **H₃ep-os* > Skt. *ápas*, not **âpas*. A distinction between $\text{ɛ}^w e$ and $\text{ɛ}^w o$ is attested in living languages, as in (North American) Shuswap.

The reflexes were explained by Kortlandt as follows. In PIE, a word could not begin with *e-*, but had a preceding *H₁-*. The laryngeal, therefore, is automatic, has no phonemic value. In the case of a following *o*, a laryngeal was automatically rounded, which is why the three laryngeals merged. Here again the laryngeal is automatic, as a word could not have just *o-*, but ('automatically') had a preceding rounded laryngeal. It is therefore understandable that the automatic laryngeals were not reflected as *h-* in Armenian.

We shall now look at the evidence.

H₁ before *e*

There is no evidence that *H₁-* ever resulted in *h-*. Compare:

**H₁e-*, the augment: *e-(kn)* 'he came'; Gr. ἔ-(βη), Skt. á-(gan).

**H₁e-* deictic particle: *e-t'e* 'that, when', beside *t'e*; Gr. ἐ-κεῖνος, Russ. è-tot, Skt. a-sáu.

**H₁esmi*: *em* 'I am'; Skt. ásmi, Gr. εἰμί.

**H₁ég(-)*: *es* 'I'; Gr. ἐγώ, Lat. egō.

**H₁epi*: *ew* 'and'; Gr. ἐπί, Skt. ápi.

**H₁erk^wos*: *erg* 'song'; Skt. arká-.

**H₁egh-*: *e^zr* 'border/edge, shore'; Lith. ežė 'border, frontier'.

**H₁elH₁-(e)n-*: *eln* 'hind, roe'; Gr. ἔλαφος, ἔλλος, Lith. élnis, OCS jelenъ.

**H₁el-eu-*: *elewin* 'cedar'; Russ. jalovec 'juniper' (< *ēl-), cf. Gr. ἐλάτη.

Other words beginning with *e-* for which an etymology has been suggested have a prothetic vowel (from a laryngeal or the later Armenian one), or go back to forms with *s-*. We conclude that *H₁-* is never represented by Arm. *h-*. (The connection of *heṛ* 'discord, strife' with Gr. ἔρις must therefore be given up. This word must have had **per-*.)

H₁ before *o*

**H₁oǵh-i(H)-n-*: *ozni* 'hedgehog'; Gr. ἐχῖνος, Lith. ežỹs, OCS ježv, OHG igil.

**H₁ors-*: *or* 'rump'; Gr. ὄρος, Ion. ὀροσπύγιον, Hitt. arras, OHG ars; the word had *H₁-* if OIr. *err* 'tail' belongs here.

Kortlandt proposes to derive *utem* 'eat' from **som* + *H₁ed-* (1986a, 40 [this vol., 70]).

H₁ before *C* and *RC*

See 11.1.2 and 11.1.3.

H₂ before *e*

H₂e- seems to be reflected by *ha-*. In the following cases this

reconstruction seems clear:

**H₂en-*: *han* 'grandmother'; Lat. *anus*, Hitt. *hannas*.

**H₂euH-os*: *haw* 'grandfather'; Lat. *avus*, Hitt. *huhhas*.

**H₂eu-is*: *haw* 'bird'; Lat. *avis*.

**H₂eu-*: *hagacim* 'become addicted to'; Lat. *aveō*.

**H₂ei-*: *hayc'em* 'beg, beseech'; Lat. *aeruscāre*; Lith. *ieškóti*.

And probably also:

**H₂ed-*: *hatanem* 'cut'; Hitt. *hattai*.

**H₂erH₃-ur, -u(e)n-*: *harawunk* 'field'; Gr. ἄρουρα; OIr. *arbor*.

**H₂enk-*: *has-anem* 'arrive at, obtain'; Gr. (ποδ)-ηνεκής 'reaching to the feet' ($\bar{e} < \bar{a}$), OIr. perf. *ánaic* 'reached'. (This root existed beside **H₁nek-* 'bring', Gr. aor. ἤνεγκ-ον, ἐνεγκ-εῖν.) Zero grade **H₂nk-* may also be possible.

**H₂eus-s-i* (loc.): *ayg* 'dawn'; the word is supposed to derive from expressions like 'at dawn', cf. Gr. ἡ-κανός 'cock' < *'singing at dawn'. The absence of *h-* is explained from the position after preposition, as in and *ayg* 'at dawn'.

H₂ before *o*

The main point is to explain why many forms with *H₂* have *a-* without *h-*. (Note that (*h*)*a-* may in some cases continue older *(*H*)*o-*.) There are two possibilities: *o*-grade or zero grade. (We shall see below that the same holds for *H₃*.)

If *H₂* before PIE **o* gave no reflex, we can explain:

H₂oid-*: *aytnum* 'swell', *ayt* 'cheek'; Gr. οἰδέω; the *H₂* is shown by Lat. *aemidus* 'tumidus, inflātus' (gloss), if this is related (aid-(s)m-*).

**H₂oi-sk-*: *ayc'* 'visit, inspection'; OHG *eiscōn*. Old *ā*-stems often have *o*-vocalism. The word contains the same root as *hayc'em* given above. It is no surprise that there is also a form *hayc'*, with *h-* from the verb; it got a slightly different meaning, 'inquiry'.

**H₂oms-o-*: *us* 'shoulder'; Gr. ὤμος (< **omsos*), Skt. *ámsa-*, Got. *ams*; if Toch. A *es*, B *āntse* point to *a*-vocalism, the root must have *H₂-*; cf. also Gr. ἀμέσω ὁμοπλάται (gloss, origin unknown).

H₂ before *C* and *RC*

In the case of zero grade we must distinguish at least two cases: *HC-* and *HR-* (with *R* traditionally considered syllabic). The first results in the so-called 'prothetic vowel'. Cf. *ayr* 'man' < **H₂nēr*. In this way can be explained:

**H₂ǵ-es-*: *acem* 'carry'; Lat. *ger-ō*; not to be compared with Lat. *agō* < **H₂eǵ-*.

For *HR-* (i.e. *HR-C*) see 11.1.3. This sequence results in *VR-C*. Cf:

**H₂rtk-o-*: *arj* 'bear'; Skt. *ṛkṣa-*, Hitt. *hartagga-*, Gr. ἄρκτος.

**H₂rg-*: *arcat* 'silver'; Av. *ərəzata-*; Skt. *rajatām*; Lat. *argentum*.

**H₂rk-*: *argel* 'hindrance, obstacle'; cf. Gr. ἀρκέω.

For *ard* 'order' see 11.1.3 on *HRC-*.

A special subcategory are the words beginning with *HRH-C* (see 11.4.2). These give *aRaC-*.

**H₂rH₃tr-*: *arawr* 'plough'; Gr. ἄροτρον, OIr. *arathar*. (That this type had zero grade is shown by Lith. *irklas* 'oar' < **H₁rH₁-*).

**H₂lH₁tr-*: *atawr-i* 'female who grinds corn'; Gr. ἄλετρο-ίς id.

Note that in this way the difference between *haraawunk* 'field' and *arawr* 'plough' is explained. (There is a form *harōr* beside *arōr*, *arawr*, which may have its *h-* from a related form with **H₂erH₃-*.)

**H₃* before *e*

H₃e is probably represented by *ho-*. The two words with *ho-* that have an etymology probably had *H₃e-*:

H₃ed-*: *hot* 'smell'; Gr. ὄζω, Lat. *odor* (H₃ed-ōs*), Lith. *úodžiu* (< **H₃ed*- with long vowel and acute intonation according to the Winter-Kortlandt Law). The exclusive *o*-vocalism points to *H₃-*. If the Armenian word continues a neuter *s*-stem, we expect *e*-vocalism.

**H₃eui-*: *hoviw* 'shepherd'; Gr. οἶς, Lat. *ovis*, Luw. *hawī-* which demonstrates *H₂* or *H₃*; the exclusive *o*-vocalism favours *H₃*, which is confirmed by Skt. *ávi-* (as this does not have a long vowel from Brugman's Law, which does not operate on *-o-* from *H₃e* according to Lubotsky's Law).

**H₃esk-*: *hac'i* 'ash tree'; Gr. ὄξύη; OIc. *askr*.

We can now explain *hum* as follows:

**H₃eHmos*, **H₂eH₃mos*: *hum* 'raw'; Gr. ὥμός, Skt. *āmá-*. The word did not have lengthened grade but rather *HVH-*. Then we need *e*-vocalism (to get the *h-*) with *H₃*; the initial laryngeal must be *H₂* or *H₃*.

Other words with *hu-* derive from **po-* + nasal.

H₃ before *o*

H₃- followed by *o* is very difficult to demonstrate.

**H₃orbh-*: *orb* 'orphan'; Gr. ὀρφανός, Lat. *orbus*, Goth. *arbi*, OIr. *orb* show full grade, and the general *o*-vocalism suggests *H₃-*. But zero grade *H₃rbh-* is also possible (as is **H₂orbh-* or **H₁orbh-*).

**H₃osd-*: *ost* 'branch'; Gr. ὄσος, Hitt. *hasdueir*; Goth. *asts* shows full grade, and the general *o*-vocalism suggests *H₃-* (but **H₃sd-* is also possible).

**H₃ost-u-*: *oskr* 'bone'; Gr. ὀστέον; Hitt. *hastai*; Skt. *ásthi* shows full grade;

but $*H_3st-$ is also possible.

$*H_3oiu-eH_2$: *aygi* 'vine'; Gr. *ῥῆ*, *οἴη* 'service-tree', Lat. *ūva* 'grape', Lith. *ievaž*, all from $*oiuā$. The laryngeal cannot be ascertained.

$*H_3oug-$: *oyc* 'cold'; OIr. *úacht* ($*oug-tu-$) 'coldness', Lith. *áušti*. The root may have had H_2- .

H_3 before C and RC

Apart from the cases with 'prothetic vowel' (see the next section), note: $*H_3kt-$: *ut* ($< *H_3pt-$) 'eight'; the form has the zero grade from the ordinal and $-p-$ from 'seven': $*opt-$ $> *owt-$ $> ut$; Gr. *ὀκτώ*, Lat. *octō*, Skt. *aṣṭā(u)*, Goth. *ahtau*.

$*H_3rghi-$: *orjik* 'testicles'; Mlr. *uirgge*, Alb. *herdhe*; Av. *ərəzi*. The general o-vocalism (Lith. *ežilas* can be for older o-) points to H_3- , but both zero grade and o-grade are possible.

Special problems

In many cases, it is impossible (as yet) to determine the colour of the laryngeal, and often also which vocalism, so that we often cannot demonstrate what happened.

Some cases are rather complicated:

$*H_1eH_2mōr$: *awr* 'day'; Gr. *ἡμᾶρ*, *ἡμέρᾱ*. For the long *ā*, we can have H_2e + a laryngeal, but that would give $h-$. We must start from $-eH_2-$ with a preceding laryngeal that does not give $h-$, which can only be H_1- .

Arm. *ateam* 'hate', Lat. *odium*, OE *atol* 'terrible' will have H_3- because of its general o-vocalism, in which case it can be $*H_3od-$ or $*H_3d-$, but we have no definite proof. H_1o- or H_2o- are also possible.

A problem is provided by *ayc* 'goat', Gr. *αῖξ*, as this could only have been $*H_2eiğ-$, but this form would have given Arm. $h-$. A further cognate has been suspected in Av. *i/izaēna-* 'of leather', but this may be unrelated. There has been much doubt about this word (and others for 'goat'), and the word may be a common loan.

Since *ogi/hogi* 'breath, spirit, soul' does not have a generally accepted etymology, we can say nothing about it. It may be related to *hewam* 'pant', which must have had $*p-$. The $h < *p$ was lost before $-o-$, so the h - must have been introduced from related forms with $h-$ from $*p-$ before other vowel (which must be $-e-$).

Another case is *aganim* 'spend the night', Gr. *ἰαύω*. The absence of h - may be explained through influence of *awt* 'place to spend the night' if from $*H_2outi$; cf. Gr. *ἀνλή* 'courtyard' (which must have $*H_2eu-$).

For $(h)aganim$ 'put on clothes' from $*H_2eu-/H_2ou-$ cf. Lith. *aunù*, *aūti* 'put on footwear'.

11.1.2 Word initial laryngeal before consonant, HC-

"Armenian is perhaps best known to scholars of Indo-European languages and Classicists as the principal Indo-European language other than Greek to show 'prothetic vowels'" (Clackson 1994: 33).

We discuss here also 11.1.3 HR- and 11.1.4 HW- where these groups are followed by a vowel so that the *R*, *W* are consonantal.

*H*₁-, *H*₂-, *H*₃- are vocalized to *e*-, *a*-, *o*- respectively. Cf. Kortlandt 1987a. There is no problem with *H*₂- > *a*-:

**H*₂*nēr*: *ayr* 'man' (via **anir* > **aynr*); Gr. ἀνήρ, Skt. *nár*- etc.

**H*₂*ster/l-*: *astl* 'star'; Gr. ἀστήρ, Skt. *stár*-, Goth. *stairno*.

**H*₂*reu-*: *arew* 'sun'; Skt. *rāvi*-.

**H*₂*k-*: *asetn* 'needle'; Gr. ἄκρος; Lat. *acus* 'needle'. The *a*- can now be identified as a 'prothetic vowel' (as full grade would have given *ha*-).

For *H*₁- > *e*- cf.:

**H*₁*reg^{wos}*: *erek* 'evening'; Gr. ἔρεβος, Skt. *rājas*-, Goth. *riqis*.

**H*₁*n(e)un*: *inn* 'nine'; Gr. ἐννέα, Skt. *nāva*, Lat. *novem*. PIE **H*₁*neun* took over the zero grade from the ordinal **H*₁*nun-os*; cf. pl. *inun-k*'. As only Greek and Armenian have an initial vowel, there is no basis for reconstructing a full grade **en(un)*- (note that this form would have *H*₁-).

**H*₁*mos*: *im* 'mine'; Gr. ἐμός, Av. *ma*-. Cf. also **H*₁*me* 'me', *inew* 'with me' (< **ime-bhi*), Gr. ἐμέ, Lat. *me* etc.

**H*₁*l(e)udh-*: *eluzanem* 'extract'; Gr. ἐλεύθερος, Skt. *ródhati*, Goth. *liudan* 'grow'. If one doubts this (long established) etymology, the root structure itself is sufficient to prove a laryngeal: *eluz*- < **H*CVVC-; the laryngeal must be *H*₁-, as the other laryngeals would have given *a*-.

With *e*- > *o*- before *o* or *u* in the following syllable:

**H*₁*reug-*: *orcam* 'vomit' (< **oruc-*); Gr. ἐρεύγομαι, Lith. *riáugeti*, OE *rocettan*. Some scholars assume a (real) Armenian prothetic vowel before *r*-. They seem not to have realized that this is impossible. PIE did not have a word-initial *r*-; apparent instances had an initial laryngeal. This laryngeal or its reflex (in Armenian and Greek) was always there: there was no period where a (real) prothetic vowel could have been added before the *r*- (as there was no initial *r*-). We know that the vowel from an initial laryngeal is much older than the Armenian prothesis. As is shown by *ayr* < **H*₂*nēr*, the vowel was there when the stress shifted to the penultimate syllable, but *eris* (acc. pl.) < **trins* shows that this (prothetic) vowel was not yet there at that time (otherwise we would have had **ers*). So if there was an initial laryngeal, this had already become a vowel before the Armenian prothesis. If one doubts that every *r*- in PIE was preceded by a laryngeal, then this is in any case true in those instances

where Greek points to a vowel from an initial laryngeal. So an Armenian vowel before an *r*- where other languages have *r*- and Greek has a vowel before this *r*- must continue an initial laryngeal. – It should further be noticed that all possible instances of *H*₁- have *e*-, or *o*- < **e*-. Presumed instances with *a*- can (and must) be reconstructed with *H*₃-: *anun* and *atamn* (see below).

For *H*₃- > *o*- note that unstressed *o*- became *a*- in Armenian (with some exceptions).

**H*₃*neid*-: *anēc-k'*, *anicanem* 'curse'; Gr. ὀνειδος, Skt. *nid-*, Goth. *ga-naitjan*.

**H*₃*bhel*-: *awel* 'broom'; Gr. ὄφελμα 'broom'.

**H*₃*bhel*-: *y-awelum* 'add to'; Gr. ὀφέλλω 'increase'. (There is discussion whether these two roots were in fact one, and on the relation with Gr. ὀφείλω 'owe'.)

**H*₃*dnt-m* (acc.): *atamn* 'tooth' (probably via **odnm* > **odmn* > **otamn*); Gr. ὀδών, ὀδούς; Aeolic ἔδοντες can easily have its *e*- from ἔδω 'eat'; old *o*-vocalism is proved by νωδός (an archaic form beside ἀνόδων) and αἰμωδέω 'have the teeth set on edge'; Skt. *dánt-*, Lat. *dens*. Lith. *úodas*, Latv. *uōds* 'gnat' (< **H*₃*e/od-*) have the same root 'bite', also found in Gr. ὀδύνη 'pain' (from which νόδυνος); a tooth does not eat, but bites.

**H*₃*neH*₃*mn*: *anun* 'name' (via **onōmn* > **anumn*); Gr. ὄνομα (< **H*₃*nH*₃*mn*), Lat. *nōmen* etc. Reconstruction of *H*₁- rests only on the Greek name Ἐνυμακράτιδας, which is insufficient evidence. The forms Gr. νόνημος < **n-H*₃*numnos*, younger ἀνώνημος, prove the antiquity of the *H*₃-. As we now know that *H*₁- resulted in *e*- in Armenian, the correspondence Arm. *a*- : Gr. *o*- can be used to prove *H*₃-. At the same time, this correspondence proves the presence of an initial laryngeal: it is most improbable that reshuffling of anlaut variants would in both languages have resulted in precisely this correspondence. (The reconstruction of the remainder of the word is irrelevant here.)

A problem is formed by the words with *an*- from **H*₃*n*-, for one would expect **on*- > **un*-: *anun*, *anurj*, *anicanem*. The solution is not clear yet. Perhaps *o* > *a* was earlier than *on* > *un*. Another possibility is that the *o* < **H*₃ had not yet coincided with the existing *o* at the time when *on* became *un*.

**H*₃*nēbh-o-* (?): *aniw* 'wheel'; the form would be a *vṛddhi*-formation from 'nave'; the etymology is uncertain. It cannot be shown that the vowel was *o*- originally.

On *H*₃*RC-* > *oRC-* see the next section, 11.1.3.

If the following two forms have zero grade (but *H*₃*o-* cannot be excluded), we find the *o*- preserved:

**H*₃*st-uer-*: *oskr* 'bone'; Skt. *ásthi*, Gr. ὀστέον.

**H₃sdo-*: *ost* 'branch'; Gr. ὄσος, Goth. *asts*.

Kortlandt thinks that *ut* < **optō* may also have zero grade; it must have had *o-* to produce *ow-* > *u-*.

The word for 'eye', *akn* from the root **H₃ekw-*, must also have zero grade because it has no *h-*. Thus it is another example of a prothetic vowel: **H₃k^w-*: *ak-n* 'eye' (the *a-* was taken from the oblique case, cf. gen. *akan*). But *H₃ok^w-* cannot be excluded.

It is generally assumed that before *w-* a laryngeal did not develop into a vowel. This assumption rests especially on *gom* 'be', which was derived from **H₂ues-*. However, Kortlandt (1998b) is opposed to this etymology on the ground that it is not clear why we would have the (vocalism of the) perfect here. There are the following other forms:

**H₁ueg^wh-*: *gog* 'speak'; Lat. *voveō*, Skt. *vāghāt-*. The laryngeal depends on the connection with Gr. εὔχομαι (< **H₁eug^wh-*), which is disputed.

**H₂uelH-*: *getmn* 'wool, fleece'; Lat. *vellus*. However, the reconstruction of this root is disputed.

Thus, the material is inconclusive, but the old view may be correct. (In Greek *Hu-* > *Vw-* is frequent.)

The laryngeals remain distinct in this case, as is probably the case in *HRC* (as we shall see in the next section) while elsewhere they coincide in Armenian. This has a parallel in Latin, where **HNC-* gives **eNC-*, **aNC-*, **oNC-* according to the laryngeal, whereas in all other instances the laryngeals have fallen together.

Finally it may be mentioned that except in Greek the laryngeals seem also to have a vocalic reflex in Phrygian and in the Anatolian languages in this position, which can hardly be accidental. It is an areal feature.

11.1.3 Word-initial laryngeal before resonant, *HR-*

The sequences with a vowel following (*HRV-*) are discussed above, in 11.1.2. Here we give the sequence before consonant, *HR-C-*. Kortlandt 1983b, 1984b, 1985b.

**H₂RC-*

There is no problem with *H₂rC-*: this gives *arC-*. Note that it yields no *h-*.

**H₂rtko-*: *arj* 'bear'; Skt. *ṛkṣa-*, Gr. ἄρκτος, Hitt. *hartagga-* etc.; see 12.4d.

**H₂rġipio-*: *arcui* 'eagle'; Skt. *ṛjipyá-*.

**H₂mbhi-*: *amb*-(olj) 'whole'; Skt. *abhí*, Gr. ἀμφί, Lat. *amb-*, OHG *umbi*.

**H₂rti-*: *ard* 'just now'; Gr. ἄρτι; Lith. *arti* 'near', with full grade.

**H₂rtu-*: *ard* 'order'; Skt. *ṛtú-* 'the right time', Gr. ἀρτύνω 'arrange', Lat. *artus* 'joint, limb'.

**H₂nk-*: *hasanem* 'arrive'; Skt. *aśnóti*, Gr. ποδ-ηνεκής 'reaching to the feet'.

**H₂ŋghu-*: *anju-k* 'narrow'; Skt. *amhú-*, OCS *ozvko*, Goth. *aggwus*. The last forms all have full grade, but the Armenian form must have zero grade, as it would otherwise have *h-*; ablaut with *u*-stems is normal, zero grade in *u*-stem adjectives is frequent.

**H₂rǵ-*: *arcat* 'silver'; Av. *ərəzata-*, Gr. ἄργυρος, Lat. *argentum*; there is doubt about the etymology, because of the ending *-at*'.

**H₂rk-*: *argel* 'obstacle'; Gr. ἀρκέω 'ward off', Lat. *arceō* 'keep off'.

**H₁RC-*, **H₃RC-*

With the other two laryngeals the question is whether they both give *a-*, or *e-* and *o-* respectively. I know just one instance for which *H₁RC-* has been assumed: *alkalk* 'poor' compared with Lith. *elgetáuti* 'beg' (*eĭgeta* 'poverty'), OHG *ilki* 'hunger'. However, the Lithuanian intonation points to **gh*, and Fraenkel gives as its correct meaning 'to behave onself, beg' and connects the word with *algà* 'salary' and further with Skt. *arghà-* 'value', Gr. ἀλφή 'produce, gain'; he does not mention the Armenian word. All this points in a different direction. Lith. *álkti* 'be hungry' requires *HVIHk-*, Russ. *lákomyj* 'naschhaft' points in another direction; it is connected with OHG *ilgi*, which stands beside *ilki* cited above. The whole group is too unclear for any conclusions.

For *H₃RC-* Kortlandt mentions several candidates: *otb*, *orb*, *orjik*, and *etungn*. I will shortly discuss them.

**H₃lbbh-*: *otb* 'lamentation'; Gr. ὀλοφύρομαι, Lith. *ulbúoti*. The Greek form, from **H₃lobbh-*, makes the existence of another full grade (with Schwebeablaut) improbable; so this case seems good. (Though it indicates sounds, the word itself is not onomatopoeic.)

H₃rǵh-*: *orjik* 'testicles'; Av. *ərəzi-*, Gr. ὄρχις, Alb. *herdhe* (H₃erǵh-*, Kortlandt 1986a, 44 [this vol., 73]), Lith. *eřžilas* 'stallion'; the Greek word can have full or zero grade, the Armenian word could have **H₃orǵh-*.

**H₃rbh-*: *orb* 'orphan'; Gr. ὀρφανός, Lat. *orbus*, Goth. *arbi*, Hitt. *harpzi* 'separate'.

**H₃ŋg^{wh}-*: in *etungn* 'nail'; Gr. ὄνυξ < **H₃nog^{wh}-*, Lith. *nāgas*, OHG *nagal*. Kortlandt (1987a, 62 [this vol., 77]) assumes that in Armenian **onog-* and **ong-* were united in **onong-*, which was dissimilated to **enong-*, and this to *etung-* (the *-n* being a secondary addition, as it so often is). It is certainly most attractive to explain *-ung-* in this way.

Thus, there are several probable, and one apparently certain instance giving *oRC-*.

As to the apparent absence of *eRC-*, it is possible that *H₇₋* in this

sequence did not influence the colour of the vowel, H_1 being the non-colouring laryngeal. However, as we saw, no certain instance of aRC - from H_1RC - is known.

As the o -colouring influence of H_3 - in this group has now been established, there is no longer reason to doubt that H_3 - is reflected as a prothetic vowel o -.

11.1.4 Word-initial laryngeal before semivowel, HW -

This configuration is difficult to demonstrate. Note that i -, u - were lost (reduced) before the stress. A good instance seems the following:

* H_2us - n :- *un-kn* 'ear'; Lat. *auris* (* H_2eus -), Gr. $οὐς$ (* H_2ous), Av. *ušī*, OCS *uxo*. The H_2 - perhaps lives on in pl. *ak-anj'k'*, whose further origin is unclear.

There is no trace of h - from Hi/uC -, so the laryngeal was apparently lost in this position.

11.2 Word-final laryngeal

11.2.1 Word-final laryngeal after vowel, $-VH$

This sequence gave a long vowel, which disappeared in Armenian, so it is difficult to demonstrate; but in monosyllables the vowel is maintained:

* meH_1 :- *mi* 'that not'; Gr. $μή$, Skt. *mā*.

11.2.2 Word-final laryngeal after consonant, $-CH$

One supposes that the laryngeal became $-a$, but as it was lost, this is difficult to prove. It may be assumed in * $-komt$ - H_2 :- *-sun* 'tens', e.g. *eresun* 'thirty'.

* $meḡH_2$:- *mec* 'great'; Skt. *māh(ānt)*-, Gr. $μέγας$. Does the laryngeal live on in the a -stem, *mecac*? However, we cannot ascertain what the ending of the nominative was; maybe it was * $meḡ$ - $eloH_2$ -(s).

11.2.3 Word-final laryngeal after resonant, $-RH$

If a vowel preceded, the development was the same as in the preceding section. If a consonant preceded, the development is unknown as there is no evidence.

11.2.4 Word-final laryngeal after semivowel, $-WH$

It has been proposed that $-iH$ -, $-uH$ became $-ya$ -, $-wa$ -, as in Greek. Of course, the final syllable disappeared, which makes it very difficult to decide the matter. Three types of evidence have been presented: 1.

plurals with the dual ending $-iH_1$; 2. compound numerals; and 3. isolated forms.

1) the plurals are the following:

cung-k 'knees' < $*\acute{g}on\acute{u}-iH_1$;

ač'-k 'eyes' < $*H_3k^w-iH_1$;

lanj-k 'breasts' < $*l\acute{n}g^wh-iH_1$.

akanj-k 'ears' < $*H_2eus-n-iH_1$.

The first form would have given the same result if $-iH_1$ had become $-\bar{i}$, and is therefore irrelevant. The following two forms show palatalization of a velar which could also have been caused by \bar{i} . The last form, however, requires $-(y(a))$ to get $-j-$. Only this j is found in all stems of the plural and it is doubtful that it originated (only) in the nominative. That is, the reconstruction given may be wrong. (The development of $*us$ to k is improbable.)

2) The numerals in discussion are (cf. Kortlandt 1994b):

a) *me-tasan* 'eleven' < $*mia-tasan$;

b) forms in *-asun*: *k'ar-asun* '40' and *ewt'an-asun* '70';

c) *eresun* 'thirty' < $*eri-asun$.

The forms show relevant differences. The first is supposed to contain a laryngeal, $*smiH_2-$; the two following (b) have *-asun*, which contains $-d\acute{k}omta$; the last had both a laryngeal ($triH_2$) and $-d\acute{k}omta$.

a) It is not evident that this form should contain the feminine ending. I propose it has $*smi(H)-o-$ (with $-o- > a$); *mi* is inflected as an *o*-stem.

b) Note that $*ewt'an-sun$ would have given $*ewt'asun$. Reintroduction of $-(a)n-$ might have given the actual form. Kortlandt argues that the (preglottalized) d lost its dental element through dissimilation and that the sequence $-n\acute{?}-\acute{?}$ gave $-ana-$, and $-t\acute{?}-\acute{?} > -ara-$ (in '40': $t\acute{u}r- > k'ar-$).

c) As it is improbable that $*eri-sun$ was changed to $*eriasun$, the $-a-$ here probably arose phonetically. If we assume $*triH_2-$, it may point to a development (in auslaut) of this form to $*tria$, as in Greek (τρία). But one might also assume that the regular development was to $*tri$, with the neuter plural ending $-a$ secondarily added. – The rise and the distribution of the $-a-$, before $-sun$, must be explained and therefore points to development from $*-d\acute{k}omt$.

3) *sterj* 'sterile' has been explained from fem. $*ster-iH_2$. (The variant reading *sterd* is isolated.) This seems a good possibility. But, apart from a suffix $-jo-$, generalization of the oblique stem $*ster-ieH_2-$ is a possibility.

Surveying the three types of argument one concludes that it is improbable that the development of $-iH$, $-uH$ was to $-ya$, $-wa$. The forms with $*-d\acute{k}omta$ have *-asun* deriving from this form.

11.3 Laryngeal in inlaut.

11.3.1 Laryngeal in inlaut, after vowel, -VH-.

11.3.1.1 Laryngeal in inlaut, after vowel, before vowel, -VHV-

The laryngeal disappeared after colouring an adjacent -e-, though it is difficult to find certain evidence.

11.3.1.2 Laryngeal in inlaut, after vowel, before consonant, -VHC-

We find the well-known treatment $eH_1, eH_2, eH_3 > *ē, *ā, *ō$ (which became *i, a, u* in Armenian).

* $meH_2tēr$: *mayr* 'mother'; Skt. *mātār*, Gr. *μᾶτηρ*, Lat. *māter*.

* $bheH_2-ni$ -.: *ban* 'word'; Olc. *bón*, OF. *bēn*; Gr. *φωνή* < * $bhoH_2neH_2$.

* g^wreH_2-n -.: *erkan* 'millstone'; OCS *žr̥ny*, Olc. *kwern*; differently formed Skt. *grāvan*-..

* neH_2bh -.: *nawt* 'fasting'; Gr. *νάφω*.

* $preH_2k-t$ -.: *erast-an-k* 'arse'; Gr. *πρωκτός* < * $proH_2k-t$ -. The form is much debated. In the way indicated both forms can be explained without difficulty. For the ablaut cf. nom. * nok^w-t-s , gen. * nek^w-t-s . (My earlier proposal * $perH_2k-t$ has the disadvantage of a root ending in three consonants, which is very rare.)

* peH_2tro -.: *hawran* 'herd'; Av. *pāθra-vant* 'giving protection'; cf. Lat. *pābulum* 'pasture'; Gr. *πῶν* 'herd' < * poH_2-iu .

* H_1eH_2-mr -.: *awr* 'day', via * $āmōr > *aur$; Gr. *ἡμαρ*. For the laryngeals see 11.1.1.

* $pleH_1-tos$: *li* 'full'; Skt. *prātā*-, Lat. (com)*plētus*.

* meH_2dos : *mit* 'mind, intelligence'; Gr. *μηδος* 'plan'. But * $mēd$ - is also possible.

* $bhreH_1-ur$ -.: *albiwr* 'spring'; Gr. *φρέαρ* < * $phrēwar$.

* H_2leH_1-ur -.: *aliwr* 'flour'; Gr. *ἄλευρον*.

* doH_3rom -.: *tur* 'gift'; Gr. *δῶρον*, OCS *darъ*.

* H_3neH_3-mn -.: *anun* 'name' via * $onōman$; Skt. *nāma*, Lat. *nōmen*; Gr. *ὄνομα* < * H_3nH_3-mn .

The etymology of *erkar* 'long' from * $dueH_2ro$ - must be rejected (Kortlandt 1989).

11.3.1.3 Laryngeal in inlaut, after vowel, before resonant, -VHR

Before vowel the development must be to $\bar{V}RV$. If a consonant follows, it depends on whether the resonant becomes vocalic (as in Sanskrit, *vāta*- < (*)*vaata*- < * H_2ueH_1nt -) or not (as in Goth. *winds*). Arm. *amis* 'month' < * $mēns$ - < * $meHns$ points to the latter development.

11.3.1.4 Laryngeal in inlaut, after vowel before semivowel, -VHW-

A good example is:

**deH₂iūēr*: *taygr* 'brother-in-law' via **daiwīr*; Gr. δᾱήρ, Lith. *dieveris*, OCS *děverb*.

11.3.2 Laryngeal in inlaut, after consonant

11.3.2.1 Laryngeal in inlaut, after consonant, before vowel, -CHV-

See 12.7 on stop + laryngeal. If the consonant is not a stop, the laryngeal disappears without trace, except for the possible colouring of a following -e-.

**genH₁os*: *cin* 'birth'; Gr. γένος, Skt. *jānas*, Lat. *genus*.

**gerH₂-*: *cer* 'old man'; Skt. *jārant-*, Gr. γέρων.

11.3.2.2 Laryngeal in inlaut, after consonant before consonant, -CHC-

The laryngeal is vocalized to -a- in the first syllable and before a cluster, and disappears in other cases. The material is limited.

**pH₂tēr*: *hayr* 'father'; Gr. πατήρ, Skt. *pitár-*, Lat. *pater*.

**bhH₂tis*: *bay* 'word'; Gr. φάτις.

**dH₃-*: *tam* 'I give'; Gr. δο-τός 'given', Lat. *da-tus* id. Present beside aorist *etu* < **deH₃-*.

**ptH₂k-*: *t'ak'č'im* 'be hidden'; Gr. πτήσσω, aor. -πτοκών.

**dH₂p-ni-*: *tawn* 'feast'; Oic. *tafn*; Lat. *daps* '(offering) meal', Toch. *tāp-* 'eat'; cf. Gr. δαπάνη 'costs', Lat. *damnum* id.

**sH₂d-*: *at-ok* 'full, fat'; Gr. ἄδρός.

**genH₁-tlos*: *cnawł* 'parent'; cf. Skt. *janitram* 'birthplace'.

**H₂erH₃-u-*: *harawunk* 'field'; Gr. ἄρουρα. See below on this form.

Here also *sał* 'salt', if it derives from **sH₂l-*.

On *erastank* see 11.3.3.

With zero from laryngeal (in non-initial syllable and before single consonant) we find:

**dhuǵH₂-tēr*: *dustr* 'daughter'; Gr. θυγάτηρ, Skt. *duhitár-*.

**-o-mH₁nos*: *-un* participial adjective, 'doing ...'; Gr. -ο-μενος.

**ienH₂tēr*: *[i]ndir 'sister-in-law' belongs here according to Kortlandt (1997); but I find the reorganizations to arrive at the actual form (*nēr*) complicated.

In first syllable, then, the laryngeal was vocalized, just as in Germanic.

In the second syllable it looks as if the laryngeal was only vocalized before two consonants. *Harawunk* seems to be an exception; the

sequence *-ara-* must come from the oblique cases, which had **H₂rH₃-* (see 11.3.3.2). *Gēmn* 'wool, fleece' is equated with Lat. *vellus*, but this word had no laryngeal.

There are some words that have initial *HRH-C*. These words can be treated under *RHC* (11.3.3.2) or here, if *R* is considered a consonant. I prefer to treat them here because they again show that the second laryngeal is vocalized before a double consonant.

**H₂rH₃-trom*: *arawr* 'plough'; Gr. ἄροτρον.

**H₂rH₁-tri-*: *alawri* 'mill'; Gr. ἄλετρις 'woman who grinds corn'.

**H₂rHm-*: *armukn* 'elbow'; Skt. *īrmā-* 'arm', Lat. *armus*, Goth. *arms*.

**H₂nHt-*: (*dr*)-*and*, 'door-post'; Skt. *ātā-*, Lat. *antae*. (Note that this form may contain **hand*, with loss of *h-* in compounds; it would require **H₂enHt-*.)

11.3.2.3 Laryngeal in inlaut, after consonant, before resonant,

-CHR-

No evidence known. The development will depend on what follows, a consonant or a vowel.

11.3.2.4 Laryngeal in inlaut, after consonant before semivowel,

-CHW-

No evidence known.

11.3.3 Laryngeal in inlaut, after resonant, RH

11.3.3.1 Laryngeal in inlaut, after resonant before vowel, -RHV- (C-RHV)

After a vowel the laryngeal behaves as a laryngeal after a consonant; see 11.3.2.1. Special developments occur after a consonant, when the resonant became syllabic, C-RHV. This category will be discussed here.

The (syllabic) resonant becomes *aR* as usual, the laryngeal disappears (as usual before vowel).

**smH-(r)*: *am* 'year', *amaṛn* (< **smH₂er-m*, cf. *jmeṛn* 'winter' < **ḡhimer-m*) 'summer'; Skt. *sāmā*, OHG *sumar*.

**smH₁-*: *amēn*, *amen-ek'-in* (pl.) 'all', *amen-a-* 'of all'; Skt. *sama-*, Gr. ἀπό-θεν 'from somewhere', οὐδ-αμ-ό- 'no one', Goth. *sums* 'some'.

**urH₁-(en)-*: *gaṛn* 'lamb'; Gr. ἀρήν, Skt. *urāṇ-*. The *-n* is secondary. Note that the zero grade of the suffix, *-n-*, would have given **garan* (see 11.3.3.2), which is also a regular form of the paradigm.

**ḡlH₂-os/-ōs*: *caṭr* 'laugh', if the zero grade root form was generalized; alternatively **ḡlH₂-s-* > **cala[h]-*, of which the *-a-* was contracted with or lost before following vowel (Kortlandt 1996a; see 11.3.3.2); Gr. γέλως

(< *ǵelH₂-ōs), γελαστός 'laughable'.

*krH₂:- *sar*, -oy 'top, summit, peak'; Skt. *śiras*-, Gr. *κόρη*, *κέρας*, Lat. *cerebrum* < *keras-ro-. The form must have alternated with the full grade, otherwise the *k̑ would have been depalatalized before *r*.

*krH-: *sārn* 'ice'; Lith. *šármas* 'hoarfrost', Russ. *seren*. Same remark as the preceding word as to the palatal.

*pnH-: *hanum* 'weave'; Lith. *pinti* 'twist', *spėsti* 'set traps', Goth. *spinnan*.

*ulH-: *galt* 'secretly'; Lith. *pra-vilti* 'deceive'.

*urH-: *vařem* 'kindle' if cognate with Lith. *virti*, OCS *variti* 'cook'; problem is the *v*- of Armenian (see 7.2.2c).

*ǵlH₂-(ou)-: *tal* 'husband's sister' (with *t*- from *taygr* 'husband's brother'); Gr. γάλως, OCS *zvlъva*.

Much discussed is the connection between *kalin* 'acorn' and Gr. βάλανος. The Greek word requires *ǵwlH₂-en-, which would give Arm. *kalan-, -eno- after H₂ becoming -ano-. The ending -in must be secondary.

11.3.3.2 Laryngeal in inlaut, after resonant, before consonant, -RHC-

This configuration is only interesting after consonant, where R can be syllabic. The Armenian reflex is C-aRa-C (Kortlandt 1991).

*ǵnH₃-sk-y-: *čanač'em* 'know' (assimilated from *canač'em); Gr. γι-γνώσκω.

*slH₂-sk-y-: *atač'em* 'ask'; Gr. ἰλάσκομαι < *si-slH₂-sk-.

*ǵnH₃-tos: *canawt* 'known' from *canaw with the suffix -to-. In the same way *atawt* 'prayer'.

*(k^w)twr-Hkomt- (from -dkomt- where -d- = -'d-): *k'ařasun* 'forty'; Gr. τετράκοντα, Lat. *quadrāginta*. (Cf. the discussion in 11.2.4.)

*dhlH₁-ro-: *dalar* 'green, fresh'; Gr. θαλερός 'blooming, fresh, abundant' < *dhlH₁-eros. This etymology has been much discussed, without convincing result. To my mind it can be understood in the way indicated here.

*ǵlH₂-s-: *catr* 'laugh' via *cala[h]-, of which the -a- contracted with or was lost before a following vowel (Kortlandt 1996a). Perhaps the zero grade root was generalized; see 10.3.3.1.

This development is much debated. To my mind, *čanač'em* can hardly be doubted. A suffix -ak^(w)- is most improbable, as PIE did not have such a suffix (it would have to be -H₂(e)k^(w)-; the only evidence is from Greek (ἀλάσσω), where it derives from (non-IE) nouns). The -w- in *canawt* etc. is convincingly explained by Kortlandt in the way indicated above. (In *ewt'anasun* the -n- must have been taken from the cardinal *ewt'n*.) For *dalar* no explanation had been given up to now; if the one given here is

correct, it confirms *-aRa-* as the regular reflex.

Other evidence is unreliable. Other presumed developments must be explained differently: *erastank'*, *erkan* and *nawt'i* have full grade *-eH₂-* (see 11.3.1.2); *cnawt* goes back on **ġenH₁los* (see 11.3.2.2); *cnawt* 'jaw' cannot be connected with Gr. γνάθος 'jaw', because the Greek word cannot be reduced to a PIE form. *Caṛr*, *gaṛn* and *kalin* have prevocalic *-RH-*; see 11.3.3.1 On *armukn* and *drand* see 11.3.2.2.

So the only reflex that can be established is *-aRa-*. This fits in very well with what we know of Armenian. Syllabic *R* becomes *aR* in Armenian, and then the laryngeal is vocalized to *a*. – A complicated instance seems to be the following:

**H₂erH₃-ur*: *harawunk'* 'field'; Gr. ἄρουρα, Lat. *arvum*, OIr. *arbor*. The word must have its *h-* from the nominative. If it is correct that a laryngeal in inlaut is not vocalized before a single consonant, the second *a* must probably be explained from the oblique cases, which had **H₂rH₃-uen-s* (cf. OIr. *arbae*), where the zero grade gave *ara-*.

On *HRH-C* see section 11.3.2.2.

11.3.3.3 Laryngeal in inlaut, after resonant before resonant,

-RHR

No evidence

11.3.3.4 Laryngeal in inlaut, after resonant before semivowel,

-RHW-

No evidence

11.3.4 Laryngeal in inlaut, after semivowel, -WH-

11.3.4.1 Laryngeal in inlaut, after semivowel before vowel,

-WHV-

No evidence.

11.3.4.2 Laryngeal in inlaut, after semivowel before consonant,

-WHC-

The sequences *-iH-*, *-uH-* resulted in **ī*, **ū* > *i*, *u*. (Attempts to show developments like *ya*, *wa* have failed.) A special development, *-uH-* > *-uk-*, is posited before final nasal by Kortlandt (1985b).

**g^{whi}Hs-lom*: *jil* 'sinew'; Lith. *gýsla* 'vein', Lat. *filum* 'thread'.

**tkiH₂-no-*: *c'in* 'hawk'; Gr. ἰκτίς. If the form must be reconstructed as **tkiH-ino-*, as has been proposed, then it is not relevant here (but in 11.3.4.4).

**puHr-*: *hur* 'fire'; Gr. πῦρ, Hitt. *pahhur*.

*uHn-: *un-ayn* 'empty' if this belongs to Skt. *ūná-* 'deficient', Lat. *vānus*, Goth. *wans* (< *uH₂n-), but Gr. εὐνις presents a problem.

*d(h)ghuH-m (acc.): *juk-n* 'fish'; Gr. ἰχθῦς, Lith. *žuvis*.

*muHs-m (acc.): *mukn* 'mouse'; Gr. μῦς, Skt. *múṣ-*, Lat. *mūs*. Here the development would have occurred after the loss of *s.

srunk' 'shin-bone' may be a loan from Iranian, but see Kortlandt 1985b.

11.3.4.3 Laryngeal in inlaut, after semivowel before resonant,
-WHR-

No evidence known.

11.3.4.4 Laryngeal in inlaut, after semivowel before semivowel,
-WHW-

Here may belong *tkiH-ino-: *c'in* 'hawk'; Gr. ἰκτίνοϛ, Skt. *śyená-*; see 11.3.4.2 and 12.4d.

11.4 Two laryngeals

11.4.1 Two consecutive laryngeals, HH

No evidence.

11.4.2 The sequence HRH

For HRH-C see on 11.3.2.2 (RHC).

11.4.3 The sequence HWH

No evidence.

12. CLUSTERS

I discuss as clusters groups of consonants that are reflected by one phoneme which is not identical with one of the consonants of the original cluster; but I added **sp*, **st* and **ps* (the first and the last being disputed, the second for the sake of coherence). So I do not treat as a cluster **pn* > *wn* (see on **p*) or **tr-* > *r-* (see on **t*). In case of doubt, I take the group as a cluster.

12.1 Clusters beginning with *r*: **rs* > *r̄*

**H₂orsos*: *oṛ* 'back' (bodypart); Hitt. *arras*, Gr. ὄρρος, (παλίν)-ορρος, OHG *ars*.

**trs-*: *t'aṛamim* (also *t'aršamim*; see 1.1.3) 'wither'; Skt. *tṛṣyati*, Gr. τέρσομαι, Lat. *torreō*, Goth. *gapaursan*.

12.2 Clusters beginning with *s.

a) *sy > y

*-osio: -oy, the gen. sg. ending of the *o*-stems. This is the only instance of the cluster. Note that nowhere else is *y preserved as y.

*-esio: -ēr gen. of 'something', with added -r (from -ro) found in many pronouns. (The nominative is z-i; i/e as in PIE **k^wid*, gen. **k^weso*, Gr. τι, τεο. The personal form is oy-r < *osio.)

b) *sw > k'

This is one of the strangest sound laws of Armenian. It is explained in Kortlandt's chronology by assuming *s > *h > *χ > k' (χ is the regular source of k') and monophonemicization *hw > *h^w followed by loss of labialization.

*suopnos: k'un 'sleep' (with u from *ow < *op); Skt. svápna-, Lat. somnus; Gr. ύπνος < *supnos

*suesōr: k'oyr 'sister'; Skt. svásar-, Goth. swistar.

*suidr-o: k'irtn 'sweat'; Skt. svid-, Gr. ιδρώς; *sueid- in Latv. sviēdri, OHG sweiz.

c) *sr > ř (like *rs, cf. 12.1)

*sues-r-os: k'ēr 'sister' gen. sg.; Goth. swistrs.

*suesr-: k'ērī 'maternal uncle'; cf. Skt. svasrīya- 'sister's son', Lat. sobrīnus 'cousin'.

*sru-: ařu 'canal'; Skt. sru-tī-. Note the prothetic vowel.

d) *sp > sp

*sper-n-: spařnam 'threaten'; Skt. sprṇóti 'kick away', Lat. spernō 'sever, despise', Olc. sperna 'kick away'. The etymology is semantically difficult.

*spel-: ařa-spel 'myth, fable'; Goth. spill 'fable', OE spell.

This is the development we expect parallel to *st > st (below). However, there are several etymologies that seem to point to p' < *sp. In case some of them are correct, no distribution is known. Cf.:

*spelg-: p'etk 'long piece of wood'; OE spelc, Olc. spjalk 'splint', spelkja.

*sper-t-: p'ert 'a torn off piece'; Olc. spiqrr id.

Cf. also p'aycatn 'spleen'; Skt. plihán-, Av. sparəzan-, Gr. σπλήν, etc. The word cannot be reconstructed, but an initial *sp- seems probable (*p- would not solve anything for Armenian).

*spoud-: p'oyt' 'zeal'; Gr. σπουδή, Lith. spáudžiu. The final consonant does not represent *d, so the etymology has been doubted; perhaps the word is non-Indo-European. The etymology can hardly be rejected, however.

A quite different relation is seen in Arm. sung/k 'mushroom', Gr.

σπόγγος 'sponge'; this is no doubt a non-IE word.

On *op'i* see on *-ps-*, 12.3.

e) **st > st* (also after *s < *k*)

**steib-*: *stipem* 'urge, compel'; Gr. *στείβω*.

**ster-io-*: *sterj* 'sterile'; Skt. *stari-*, Gr. *στεῖρα*, Lat. *sterilis*, Goth. *stairo*.

**H₂ster-*: *astl* 'star'; Skt. *stár-*, Gr. *ἀστήρ*, Lat. *stēlla*.

**ues-tu-*: *z-gest* 'cloth(es)'; Lat. *vestis*, Goth. *wasti*.

**dhugH₂tēr-*: *dustr* 'daughter'; Skt. *duhitár-*, Gr. *θυγάτηρ*, Goth. *dauhtar*.

Note that the laryngeal disappeared, and that only then the *-t-* came to stand after the *s < *k*. (The palatal in Armenian is due to the preceding *u*.)

f) **sk*, **sk̑*, **sk^w > c'*

After **s* no *k̑* could occur in PIE, only **sk* (or **sk^w*). As **k^w* became *k*, it is probable that **sk^w* gave the same result as **sk*.

**H₃esk-*: *hac'i* 'ash tree'; OHG *asc*; Gr. *ἄσκη* with metathesis.

**pr̥k-sk-*: *harc'-anem* 'ask'; Skt. *pr̥cchāti*, Lat. *poscō* (< **porc-sc-*). It is probable that in the group *-sk-* the first *k* disappeared through dissimilation as in Greek and Latin (and already in PIE?).

**preisku-*: *erēc'* 'elder, priest'; Lat. *priscus* 'ancient'; Gr. *πρέσβυς*, Cretan *πρεῖγυς*.

**skelH-*: *c'elum* 'split'; Lith. *skėlti*.

skid-* (perhaps [skhid-*] = [**sghid-/*]): *c'tim* 'scratch', < **c'it-*; Skt. *chid-*, *chinātti*, Gr. *σχίζω*, Lat. *scindō*.

On palatalized forms see 10.5.4.

12.3 Clusters beginning with labials

**ps > s-*; also *-p'* has been proposed

As in the case of **sp*, the development is not well documented. The best evidence is:

**prep-s-*: *eres* 'face'; Gr. *πρέπω* 'be conspicuous'.

**ps(e)ud-*: *sut* 'lie'; Gr. *ψεύδομαι*, *ψυδρός*, Slovak. *šudit'*. The word may be non-Indo-European, cf. Gr. *ψύθος*.

This development is, if not confirmed, at least not contradicted by **pst- > st-*:

**psteno-* (*-ē-*): *stin* 'woman's breast'; Av. *fštāna-*, Gr. *στηνίον*.

The evidence for *-p'* is:

**(s)eps-*: *ep'em* 'cook'; Gr. *ἔψω*. The word has no further relatives and may be a loan from a non-Indo-European language.

**(H)ops-*: *op'i* 'white poplar'; OE *apse*, Russ. *osína* (< **ops-*), cf. Turkish *apsak*; Germanic forms like OHG *aspa* may have metathesis; it is more

probable that the Armenian form goes back to the eastern forms with *-ps-*. The word does not look Indo-European.

12.4 Clusters beginning with a dental

a) **dhy > ĵ*

**medh-io-*: *měj* 'middle'; Skt. *mádhyā-*, Gr. μέσ(σ)ος, Lat. *medius*. On *ē* cf.

13.2.

**seH₂dh-io-*: *aĵ* 'right'; Skt. *sādhú-*.

Cf. Kortlandt 1994a. There are no certain instances of *t* or *d* + *y*.

b) **tw > k'*

**tue/o-*: *k'ez* 'you' dat.-acc., *k'o* gen.; Skt. *tvām*, *tva-*; Gr. σέ acc. < **tue*.

**twr-*: *k'ar-* in *k'arāsun* 'forty'; the form is the zero grade from **k^wetuōr*, **k^wetur-*; Skt. *turīya-*, Gr. τρά-πεζα 'table' (< 'four-footer'), Myc. *topeza* /*torpeza*/.

The development went through **k^w* (a development known from other languages) and loss of labialization (well known from Armenian); see the chronology.

c) **dw > k* The development of this cluster is much debated since Meillet assumed that it resulted (word initially) in *erk-* (with prothetic vowel). The material on which he based this is the following:

**duō-*: *erku* 'two'; Skt. *dvā*, Gr. δύο, δύο, OCS *dwā*.

**dueH₂ro-*: *erkar* 'long'; Gr. δηρός, cf. Skt. *dūrā-*.

**du(e)i-*: *erke-ay* (aor.) 'be afraid' < **erki-ay*, pres. *erknč'im*, *erkiwt* 'fear'; Av. *dvaēṣā* 'threat', Gr. δειδω < **de-duoi-a*.

**eduōn*: *erkn* 'birth pangs'; Gr. ὀδύνη.

There has always been opposition to Meillet's theory. The expected outcome of *dw* is *k*, parallel to *tw > k'* (as Meillet himself believed earlier). This development is shown by:

**meldui-*: *melk* 'soft'; Skt. *mṛdú-*, fem. *mṛduī*, Lat. *mollis* < **mldui-*. This can be reconciled with Meillet's theory as being the internal development (and: after resonant). There are the following objections: 1. the phonetic aspect; 2. objections to the etymologies, and 3. counter-evidence. Ad 1. Proponents of Meillet's theory have not succeeded in giving a satisfactory phonetic explanation of the development, as they mostly admit (while that to *k* is unproblematic). Ad 2. As regards *erkn*, the Greek form points to *H₃-*; the word probably belongs with ὄδων, for which notably *ωδός* proves *H₃-*. The etymology must thus be given up. As to *erkar*, there is an Armenian suffix *-ar*, and the existence of *erk-ayn* with the same meaning suggests that the word *erkar* contains this suffix; this

analysis refutes the etymology. (The connection with Lith. *eřdvas* 'spacious' must probably be given up, as its accent points to a **dh*; the development of **dhw* is unknown: one expects *g*). The word for 'two' is problematic too, as *er-* can only have been added after the loss of final vowels (otherwise **erku* would have become **erk*). And Kortlandt puts the loss of final vowels (stage 16) *after* the rise of prothesis (14) and the metathesis (15; for *-rk-* must have arisen through metathesis from *kr-* < *dw-*). So the etymology of *erku* seems impossible.

Ad 3. Most important is the counter-evidence, especially regarding the word for 'two'. Kortlandt follows Pedersen in assuming that the word was **ku*, with *er-* later added from *erek* 'three'. Most convincing is *kic* 'conjoined, contiguous, adjoining, together' beside *erkic*-s 'twice'; the word can be compared with OHG *zwisk* 'double' < **dui-sk-*. The second form was 'modernized' after the new form of the word for 'two', the first therefore developed a more remote meaning (from 'two together'). Quite convincing is also *kr-kin* 'double' with *kr-* from **kir*, which is found in *erkir* 'second' (cf. *mekin* 'single'). Note also *kuł* 'double', most probably connected with 'two', perhaps from **duo-pl-o-*.

One concludes that the phonetic development of *erk-* is improbable, that there are objections to the etymologies, and that for 'two' there are several forms pointing to *k-* < **dw-*.

d) *TK̑

This is the problem of the correspondence Skt. *kṣ* - Gr. *κτ* etc. The discovery of Hitt. *tēkan* has shown that most of these forms go back to a dental followed by a velar. Armenian has two or three instances of this cluster.

**d(h)ǵhuH-*: *jukn* 'fish'; Gr. *ι-χθῦς*, Lith. *žuvis*. In Armenian the dental was lost and the velar developed regularly. (On *-k-* see 10.3.4.2.)

**H₂rtko-*: *arj* 'bear'; Skt. *ṛkṣa-*, Gr. *ἄρκτος*, Hitt. *hartagga-*. For **k̑* we expect **c̑* (instead of *s* in the series *s - c - j*); with the preceding dental this may have given *c̑*. This sound must have become voiced after resonant, as usual in Armenian, giving *j*. Then **H₂rtk̑-* > **arj* got the suffix *-io-*, giving **ardj-* > *arj*.

**tkiH-in-*: *c'in* 'kite'; Gr. *ἰκτῖνος*; Skt. *śyená-*, Av. *saēna-*. We have the same development in Armenian as assumed in the preceding item. (The forms go back to a complicated paradigm, e.g. **tkiēH-iōn*, **tkiH-in-os*.)

12.5 Clusters beginning with velar

a) **k^wy*, **ky* > *č̑*

The result is the same as before *e*, *i*, section 9.5.4.

**kiou-*: č'og-ay 'I went'; Skt. *cyávate*, Gr. *σεύω*.

**gnH₃-sk-je/o-*: čanač'-em 'know' from **canač'-*; Gr. *γί-γνώ-σκω*, Lat. *nōscō*.

Note that the -s- also merged with the reflex of the cluster.

**H₁kw-iH₁*: ač'-k' 'eyes' if -iH₁ developed to -ya (and not to -i).

**uokw-je/o-*: goč'-em 'cry', if the verb indeed had -je/o-.

No instances of **g^wy* (> č ?) or *g^why* (> j ?) are known.

b) **kw* > š

**kuōn*, **kuon-m*: šun 'dog'; Skt. *ś(u)vá*, Gr. *κύων*.

**H₁ekuo-*: ēš 'donkey'; in PIE 'horse', Skt. *áśva-*, Lat. *equus*. The ē < **ei* comes from **e* before a palatal consonant; see 13.2.

c) **ks* > c' There is only one instance known:

**sueks*: vec' 'six'; Av. *xšvaš*, Gr. *ἕξ*, *ἑξ*, Welsh *chwech*.

Note that we have:

**ksd* > **kst* > **kšt* > **čst* > št in: *veštasan* 'sixteen' from **sueks-dekm*.

d) **k^ws*, **ks* > c', palatalized š (see 10.5.4).

There are no data, so the result is inferred from **ks* (12.5c) and from *sk(w)* (12.2f).

For a 'palatalized' form cf. **uek(w)seros* > *gišer*. The exact conditions of this development are not yet clear. Perhaps -*k(w)sp-*, which was the original cluster, gave **-kš(p)-*, cf. the preceding section on *veštasan*. Cf. also on 10.5.4.

12.6 Stop + laryngeal

This is of course the question of the 'tenues aspiratae'. Since the discovery of the laryngeals, it has been proved that PIE did not know voiceless aspirates but that the relevant material goes to a large extent back to clusters of stop + laryngeal. The Armenian material is very difficult. We shall discuss the clusters separately.

a) **pH* > p' ? (also after s)

**pH₂el-?*: p'ayl 'luster'; Skt. *phalgú-* 'reddish'. Not very convincing. For the Sanskrit word foreign origin has been claimed.

**(s)perH₁-*: *sp'ir-k'* 'dispersion', *sp'rem* 'disperse', *p'arat* 'dispersed' (< **prH₁-*); Skt. *sphuráti* (< **sprH₁-e-*) 'kick away with the foot', Lith. *spirti*. I think it not very probable that this root had a laryngeal after the p, because it had one at the end of the root. (I considered the possibility that Gr. *ὀσπρίω* 'flounder' represents **H₂sp-* and that this first laryngeal was in some languages moved to the position after the p.)

**peH₃l*?: *p'ul* 'fall'; Lith. *púolu*, *pùlti* (from **plH₃*- with metathesis?), OHG *fallan*. It seems improbable that this root also had a laryngeal after the *p*.

**p(h)u*:- *p'uk* 'breath'; Skt. *phūt-kṛ*- 'blow', Gr. *φῦσα* 'blowing'. The word is clearly onomatopoeic and cannot be used as evidence for **pH*-. Note that in Greek the cluster did not give *ph*-.

The conclusion is that there is no convincing evidence. Still it is not improbable that the outcome would have been *p'*.

b) **tH* > *t'* (?)

**portH*?: *ort'* 'calf'; Skt. *pr̥thuka*- 'young animal', Gr. *πόρις*, *πόρις* (Myc. instr. pl. *potipiqe* /*p̥ortip̥hi-qe*/?). But the Sanskrit word is very late and not found elsewhere in Indo-Iranian, and in the Greek word the *-t-* does not belong to the root.

**pl̥tH₂u*:- *y-alt'* 'large'; Skt. *pr̥thú-*, Gr. *πλατύς*, both 'broad'. The analysis of the Armenian word is uncertain.

So here again there is no certain evidence. If the outcome would be *t'*, it would coincide with *t' < *t*, but after a resonant this would have become *d*, so *ort'* and *alt'* would show a specific reflex.

c) **k^wH*, *kH* > *x* (also after *s*)

kH₂ed*:- *xacanem* (-*c* < -*d-s*-; Kortlandt 1994a, 27f. [this vol., 104f.]) 'bite'; Skt. *khādati* 'chew' (kH₂ēd*-?), Lith. *kāndu*, *kāsti*, Polish *kąsac* (< **kH₂-en-d*-, which is a strange formation; it could be simply **kond*-). The etymology is doubted.

**skHel*:- *sxalem* 'err, stumble'; Skt. *skhalate* (very doubtful Gr. *σφάλλω*, which would require -*k^w*-).

*(*s*)*keH₂k(e)H*?: *c'ax* 'branch'; Skt. *śākhā*, Goth. *hoha* 'plough'; Lith. *šakà*, OCS *soxa*. The structure of the word would be rather strange. The short **a* of Slavic cannot be explained (laryngeal between consonants does not vocalize), or if we assume **o/ō*, the Armenian form cannot be explained. The forms with nasal (Skt. *śankú-*, OCS *sokъ*, Welsh *cainc*, Olc. *hār*) prove that the word is non-Indo-European. (Arm. *c'*- can represent **sk*-; *s*-mobile is frequent in European substratum words.)

The connection of *xalam* 'to play' or *xatalem* 'reassure' with Gr. *χαλάω* 'slacken, loosen' is quite doubtful and not relevant: Gr. *χ*- cannot represent **kH*-. – That *glux* 'head' is cognate with Lith. *galvà* etc. is quite uncertain. The origin of the -*x* is unknown.

There is no reason to suppose a laryngeal in *c'tim* 'scratch' (Gr. *σχιζω*); see 12.2f.

Again the conclusion is that the material is meagre and mostly unreliable.

13. OTHER DEVELOPMENTS

13.1 *i-a > ea*

When in inflectional forms or in word-formation an *a* comes after an *i*, this *i* is lowered to *e*:

tari 'year' instr. *tare-aw*

ordi 'son' + *-ak*, diminutive suffix: *ordeak*

Note that if *-ea-* is followed by another syllable, i.e. is pretonic, it is reduced to *-e-* according to the general rules (see 2.2):

**gini-a-tun* 'wine-house' > **gineatun* > *ginetun*

If the form in *-i* is monosyllabic, it remains unchanged:

ji 'horse' gen. *jiwoy*, *ji-a-wor* ' (horse)rider'

13.2 **e* > **ei* > *ē* before *š*, *ž*, *j*

There are a few instances where **e* became **ei*, which developed normally to *ē*; its pretonic form is *i* (as usual).

**H₁ekuo-*: *ēs* 'donkey'.

**medhio-*: *mēj* 'middle'.

**uek^wsero-*: *gišer* 'night'; OCS *večerv*, Gr. *ἔσπερος*. The development **e* > **ei* > *ē*, reduced grade *i*, solves the vocalic part. See further 12.6d.

**H₁eg^whis*: *iž* 'snake'; Gr. *ὄφις*, Skt. *āhi-*, Av. *aži-*. Arm. *ž* points to a (pure) velar or a labiovelar which was palatalised before the *i*; it must therefore be connected with Gr. *ὄφις* etc.; but the word must have had **e* (like Gr. *ἔχις* which, however, has **ǵh*). The **e* became **ei* > *ē*, of which the reduced grade *i* (cf. gen. *iži*) was extended to the nominative.

13.3 **io* > *wo* and *iw* > *u*; *tuənʃean*.

The suffix **-io-* (often noted **-iio-*; the glide is not phonemic) becomes *-wo-* when a syllable follows. This happens e.g. in the inflection: *ordi* 'son', gen. *ordwoy*, instr. *ordwov*.

The sequence *-iw-* (from word final *-iw* < **-iw-*, or from **-ip-*) becomes *-u-* when followed by a syllable, i.e. before the stress:

aniw 'wheel' gen. *anuoy*

tiw 'day' gen. *tuənʃean* This development can also be seen outside the inflection:

**H₂rǵip-ios*: *arcui* < **arciw-i* 'eagle'; Skt. *ṛjipyá-* 'dashing'. The form *arciw* is younger.

**stip-*: *stuar* 'solid, huge' < **stiw-ar*; Lith. *stiprūs* 'strong'.

What happened in both cases is that *i* was reduced to *a*. The development may be envisaged as follows (non-phonemic elements in superscript):

io > *a^wo* > **wo* > *wo*

iwo > *əwo* > *u^{wo}* = *uo*

On this development Kortlandt 1976, 99 [this vol., 8].

As to *tuənjean*, the genitive of *tiw* 'day', the form is based on **tiw-in-ǵ* (-in- < **-en-*). Here we find beside *iw* > *u* also -i- > *ə*. It is unique in that the reduced vowel is written in inlaut (in anlaut this is normal, though rare: *ənderk* < **inder-* < **H₁enter-*). It is here found after a vowel, of which it is the only instance. It has phonemic value here, and is therefore indicated.

13.4 **opC* > **owC* > *uC*

A **p* before consonant develops into *w*. If this *w* is preceded by **o*, the sequence **opw* develops into *u*: **suopnos*: *k'un* 'sleep', via **k'own*; Skt. *svápna-*, Lat. *somnus*.

13.5 The sequence *-nK^w-*

This is the *awcanem* 'anoint' problem. It appears that the sequence **-ong^w-*, **-ang^{wh}-* became **-awǵ-*, **-awǵh-* > *-awc-*, resp. *-awj-*. The forms are:

**H₃ng^w-*: *awcanem* 'anoint'; Lat. *unguō*, *ungen*, OIr. *imb* 'butter'.

**H₂ng^{wh}-i-*: *awj* 'snake'; Lat. *anguis*, OHG *unc*; Lith. *angis*, acc. *aĩgi* has full grade.

The development has been much discussed as it is phonetically unexpected. It has been suggested that it was a kind of *w*-epenthesis, the sequence *-wnK-* losing its *-n-*. The fact that the velar becomes a palatal after the *u* suggests a very early date (Kortlandt's stage 2). (Note that the development proves the existence of labiovelars at one time in Armenian.) – Not relevant is *ankanim* 'to fall', which is not cognate with Goth. *siggan* 'to sink'; *ankiwn* does not have a labiovelar (OHG *enka*).

**H₂eng^{wh}-* (rather **H₂eug^{wh}-*): *awji-k'* 'collar'; it has been equated with Gr. *αὔχην*, Aeol. *αὔφην*, *ἄμφην* 'neck'; however, the Aeolic forms are doubtful and unexplained: Greek does not have such a development (and everything points to the first form being the original). The word is probably non-Indo-European.

13.6 **-aug-* > **-ag(w)* > *-ak-*

This development is found in:

**H₂eug-*: *ačem* 'grow' (with palatalized **k* < **g*); Lat. *augēre*, Gr. *αὐξάνω*. Kortlandt (1980b, 99 [this vol., 27]) suggests that in this way may also be explained (with **ouk-* > **ok^w-*):

**oukid* (< **H₂oiu k^wid*): *oč'* 'not' (with palatalized *k*); cf. Gr. *οὐ*.

Again, this development is unexpected.

13.7 *y*-epenthesis

In 6.3c, epenthesis from *y* has been mentioned, as also that from *-i-*. Further, *i* < *ē* could cause *y*-epenthesis, as is shown by:

**H₂nēr*: *ayr* 'man', from **aynr*; Skt. *nār-*, Gr. *ἄνῆρ*, etc.

This is the only example; *ayr* 'cave' cannot come from **antēr*; the connection with Gr. *ἄντρον* must probably be rejected.

13.8 *w*-epenthesis

In a few cases an *u* seems to have caused *w*-epenthesis before the preceding consonant. In fact there is no certain evidence. For instance, *giwt* 'finding' clearly belongs to the root *git-*, and it is quite possible that the epenthesis was caused by a following *u*, but it cannot be demonstrated. *Hiwt* 'matter, moisture' has been connected with Skt. *pitū-* 'nourishment', Lith. *piētūs* 'lunch', but the etymology is semantically doubtful. A good instance seems *awli* 'strong drink' beside Olc. *ql* 'beer' < **alu-*.

Some cases are doubtful. Thus *awr* 'day' < **H₁eH₃mōr*, through **amur* has been explained as > **amur* > **awmr*, but others (Kortlandt) prefer **amur* > **aur* with loss of the *m* before *u*. *Artawsr* 'tear' (beside pl. *artasuk*), which is no problem when the condition is that only a lost *u* causes epenthesis) is explained differently by Kortlandt (1985a). On *gewt* see 13.9. *Awcanem*, *awj* and *awjik* were treated separately, in 13.5.

13.9 *-et*, *-it* > *-ewt*, *-iwt*

A word-final *-t* produces a velar glide after *e* and *i*, written *-ewt*, *-iwt* (also when the *t* was followed by another consonant: *piwtc* 'dirty'). It occurs in inlaut only where it can be explained as due to analogy from word-final position. As the forms without *-w-* are still found, the development was late: *šit*, *šet*, *šiw* 'branch, stalk'; *ce*, *cil*, *ciwt* 'stalk'.

The sequence *-ewt* became *-iwt*. Thus it became identical with that which had original *-iwt*. Then *e* and *i* became mixed up. The confusion became even greater when *-wt* was introduced into other case forms, e.g. *šiwli* for the old form *šli* (which shows that the form had originally an *-i-*). Of course, not all forms are attested. Thus, we have *ewt* 'oil' (from Gr. *ἐλαιον*), gen. *iwtōy*; the nominative, of course, must also have had the form **iwt*.

13.10 *c'* > *s* before *c'*, *š*

When in morphology *c'* came to stand before *c'*, *š*, it became *s*:

sirec'ic' 1. sg. aor. subj. 'I will love', beside

siresc'es 2. sg. < **-c'-c'es*

siresjik' 2 pl. < *-c'-jik'

On the endings see Kortlandt 1981c.

13.11 Final -y after vowel

-y after vowel is not pronounced in -ay, -oy; cf. the gen. ending of the *o*-stems *-osio > -oy. (We do not find *-ey, as *ei had become ē, pronounced -e.) However, after *i* and *u* it disappeared so early that it is no longer written:

**kiutis*: č'u 'departure, journey, way' from *č'uy; Skt. *cyuti*-.

**klutos*: lu 'famous', < *luy; Skt. *śrutá*-, Gr. κλυτός. (Kortlandt thinks that the intermediate form was rather *luw; cf. 10.3.1g.)

13.12 Loss of stops between consonants

The verbs *dar̥nam* 'return', *bařnam* 'lift, raise', given their aorists *darjay*, *barji*, go back to **darj-nam* etc. with loss of the stop. In other cases the stop may have been restored or have a different history: *erdnum* 'swear' probably derives from **erdu-num*, where the *u* became ə as usual.

13.13 Metathesis

A cluster stop + *r* was metathesized, at a stage when initial voiceless stop before consonant had disappeared. In that case a remaining *r*- got a prothetic vowel, *erewim* 'appear' < **prep*-. In inlaut these stops became -w- (**patros* > *hawr*, gen. sg.). So only PIE **b*, **bh* etc. are concerned which regularly became *p*, *b* etc. in Armenian. The metathesis occurred not only in inlaut, but also in anlaut (probably after a shwa had arisen before the cluster). In the latter case the (newly initial) *r*- got a prothetic vowel *e* or *a*; see ch. 5. – It is unknown what happened with groups of the type **d*, **dh* followed by -l-, -n- in the same position, as no instances are known.

(Initial cases are given first.)

**bhr* > *rb*

**bhreH₂tēr* > *elbayr* 'brother', through **erbayr*.

**bhreH₁ur* > *albiwr* 'spring', via **briwar* > **briwr* > **abriwr* > **arbiwr*.

**dhabhro*- > *darbin* 'smith'; probably a non-IE word.

**kubhro*- > *surb* 'pure, holy'.

**dr* > *rt*

**drak*(-) > *artawsr* 'tear'. pl. *artasuk*; OHG *trahan*, Gr. δάκρυ. See on the word Kortlandt 1985a.

**syidro*- > *k'irtn* 'sweat'; Gr. ἰδρώς, Latv. *sviēdri*; Lat. *sūdor* < **swoidōs*.

**bhidro*- > *birt* 'rigid, rude'; OS *bit(t)er* 'bitter'.

**g^wr* > *rk*

* $g^{wre}H_2-n- > erkan$ 'millstone'; Lith. *gìrna*, Skt. *grávan-*.

* $ghsr > rj$

The only instance is:

* $meghsri$: *merj* 'near'; Gr. $\mu\acute{\epsilon}\chi\rho\iota$ 'up to'. See 10.5.4.

* $ghr > rg$

* $ghrondi-$: *argand* 'womb'; OCS *grǫdъ* 'breast'.

In this way Armenian avoided consonant clusters at the beginning of a syllable. It had nothing to do with open syllables (*surb*; *dar-bin*; **dabrin* could have been pronounced *da-brin*, like *pa-tros* in Attic). This seems to be connected with the fact that in Armenian all old consonant clusters had become single phonemes: **sk* > *c'*, **ky* > *č'* etc. Such languages do not normally have geminates, which is also true of Armenian.

Apparent clusters as in *drand* 'door-post' have an *a* which is not written: here *dār-* comes from *dur-* 'door'.

14. RELATIVE CHRONOLOGY

14.1 Intermediate stages

In the foregoing we have mostly presented the PIE starting-point and the reflex at the earliest stage of Armenian known to us. However, these developments went through several intermediate stages. If we want to understand what really happened we have to study these successive stages. As the developments leading to Armenian often were not simple, the relative chronology of these stages gives us a possibility to check new etymological proposals: the sound laws must follow the same order every time.

A chronology of a large number of developments has been given by Kortlandt (1980b), and we shall give a survey of them here. Before that it will be useful to give a survey of the intermediate stages which he proposed.

It should be noted that not all developments have been listed in this chronology, largely because it was unclear where they had to be inserted.

* $p > * \varnothing$ (10) > *h-* (12)

$V \varnothing V > w$ (13)

$\varnothing C > *fC$, *C-* (12b); * $fC > wC$ (13b)

* $t > * \vartheta$ (10) > *t'* (19)

$V \vartheta V > y$ (13)

$\vartheta C > *fC$, *C-* (12b); * $fC > wC$ (13b)

* $k > * \chi$ (10) > *k'* (19).

$V \chi V > y$ (13)

- $\chi^C > *fC, C^-$ (12b); $*fC > wC$ (13b)
 $*k' > *s' (3) > s$ (6)
 $*s > *h$ (5) $> \text{zero}$ (10)
 $*h > -\chi$ (11) $> k'$ (19)
 $*w > *\gamma^w$ (11) $> *\gamma$ (18) $> g$ (19)
 $*\gamma^w > *\gamma$ before u, r (12c) $> \text{zero}$ (13c)
 $*-\gamma^w > w$ (17a)
 $*-\gamma^wr > -wr$ (17b)
 $*-\gamma^w\chi > *-\gamma^{(w)}$ (17c) $> -\gamma$ (18) $> -g$ (19)

Clusters

- $*sw > *hw$ (5) $> *h^w$ (7c) $> *\chi^w$ (11) $> *\chi$ (18) $> k'$ (19)
 $*sr, rs > *hr, *rh$ (5) $> \bar{r}$ (10)
 $*sk > *c' (3) > *c$ (6) $> c'$ (10)
 $*tw > *t^w$ (2) $> *k^w$ (9) $> *\chi^w$ (10) $> *\chi$ (18) $> k'$ (19)
 $*dw > *d^w$ (2) $> *g^w$ (9) $> *k^w$ (devoicing of the glottalic stops before 10) $> k$ (18)
 $*kw > *c^w$ (2) $> *s^w$ (7) $> \check{s}$ (12c)

14.2 Relative chronology I give Kortlandt's chronology (1980b), with the change indicated in Kortlandt 1993, 10 [this vol., 102], n. 1 and 2 (17b $>$ 13b), with his numbering.

0. Proto-Indo-European. The unaspirated voiced consonants, which were (pre)glottalized, were retained as such (but devoiced) in Armenian up to historical times. The velars after u were neutralized, giving palatovelars (k etc.)

1. Loss of aspirated stops. So PIE $*t$ $*'d$ $*dh$ became $*t$ $*'d$ $*d$.

It is assumed that the loss of aspiration was a dialectal Indo-European development, which Armenian shared with Germanic and Balto-Slavic, and further with Albanian, Iranian and Tocharian.

2. Rise of new labialized stops.

The following clusters became monophonemic, as indicated (with the final result added in the third line):

	$*kw$	$*tw$	$*dw$
through	$*c^w$	$*t^w$	$*d^w$
(became	\check{s}	k'	k later)

To the same stage are dated:

- a) $*-ug-$ $> *-u\acute{g}$ ($*i\acute{u}g\text{-}om > luc$ 'yoke')
 $*-euk-$ $> *-euk-$ ($*leuk- > loys$ 'light')
 b) $*aug-$ $> *a\acute{g}^w-$ ($*aug- > a\acute{c}em$ 'grow')
 $*ouk-$ $> *ok^w-$ ($*H_2o\acute{i}u\text{-}k^we > *ouk^we > o\check{c}'$ 'not')

- c) loss of labial(ization) before *u*, (consonantal) *r*
(not before *o*, Kortlandt p.c.)

(**neu-ro* > **nowro* > *nor*)

(**bhreH₁-ur-os* > **brey^wr-os* gen. sg. > **breyr* > *alber* 'spring', 13b)

- d) **s^w* (from **k^w*) > *š* (**k^won* > **s^wun* > *šun*)

13. Loss of fricatives, intervocalic and anteconsonantal

- a) intervocalic **ʒ*, **χ* > *y* (which is lost between vowels)

(**pH₂tēr* > *hay[i]r*)

(**k^wetwores* > **č^eχ^wor* > *č'ork'* 'four')

This development did not take place after (nonsyllabic) resonants:

(*awt'* 'sleeping place', *ewt'n* 'seven')

**ʒ*, **χ* > zero before **r*

(**pH₂tr₁-bhi* > **haʒr₁-bi* > *harb* instr. sg.)

- b) intervocalic **φ*, and **f* before consonant (from 12b) > *w*

(**prep* > **reφ* > **ref* > *erewim* 'appear')

(gen. sg. **haʒroχ* > **hafroχ* > *hawr*)

Newly arising *ew*, *ow* did not merge with earlier *eu*, *ou* (which became *oy*); new *ow* > *u*

(**septm* > *ewt'n* 'seven')

(**H₃eklō* >> **oφtu* > **owʒu* > *ut* 'eight')

(**swopnos* > **χ^wown* > *k'un* 'sleep')

γ^w > *w* before final *r*

(*albiwr*)

This development was blocked by the preceding resonant in
**deH₂iwēr* > **tayγwir* > *taygr* 'husband's brother'.

- c) The delabialized (12b) **γ* > zero between vowels, and before *r*

(**bhreH₁-ur-os* > **breyroh* > *alber*)

14. Loss of syllabic resonants.

**r̥*, **l̥*, **n̥*, **m̥* > *ar*, *al*, *an*, *am*

In this way final nasals after vowel became possible again.

Prothetic *e*- before *r* and before initial clusters.

15. Metathesis

It is assumed that **bhreH₂tēr* > **ebrayr* > *elbayr* 'brother'

Kortlandt also takes here the type **H₂elios* > *ayl* 'other' (see his remark on stage 16).

16. Apocope (loss of final vowels)

i or *u* was preserved as an epenthetic *y* resp. *w* when the preceding vowel was *a*:

(**H₂nēr* > **anir* > **aynr* > *ayr* 'man')

(*artawsr* 'tear' < **drak-u*-)

The loss of the final vowel was later than the metathesis in **H₂elios* > **ayl-*

17. Simplification of consonantal articulation.

a) Final **-γ^w* > *-w* (**neH₂u-* > **nāγ^w-* > *naw* 'ship')

b) now 13b.

c) Final **-γ^wχ* > **-γ^w* or **-γ* (which became *-g* in 19)

(gen. **areγ^w-[o]χ* > *areg* 'sun')

18. Loss of labialization.

This affects not only the original labiovelars, but also those that arose secondarily: **k^w* < **t^w* [9] (*k'ez*) and **χ^w* < **h^w* [11b] (*k'oyr*).

19. Shortening of fricatives.

**θ*, **χ*, **γ* > *t'*, *k'*, *g*

(After *s* the *g* was voiceless in *skesur* 'mother-in-law'.)

Note that **φ* had disappeared earlier. (12, 13b)

20. Rise of new *x*.

The laryngeals after stop **pH*, **tH*, **kH* became affricates or aspirated stops; the latter now became *x*. (**kH* > **q^h* (10) > *x* (20))

(**skH-* in *sxalim*)

21. Influx of Iranian loanwords.

22. Reduction of pretonic vowels.

14.3 Examples.

Here are some examples where all stages are given (some have not been dated).

**treies* > **treieh* (5) > **treeh* (which Kortlandt now dates to stage 6, p.c.) > **θreh* (10) > **θreχ* (11) > **reχ* (12b) > **ereχ* (14) > *erek'* (19).

**swopnos* > **hwopnoh* (5) > **h^wopnoh* (7c) > **h^woφnoh* (10) > **χ^woφnoh* (11) > **χ^wofnoh* (12b) > **χ^wowno-* (13b) > **χun-* (18) > *k'un* (19).

**k^wetwores* > **k^wetwores* (2) > **k^wet^woreh* (5) > **č^wet^woreh* (8) > **č^wek^woreh* (9) > **č^wek^woreh* (10) > **č^wek^woreχ* (11c) > **č^weoreχ* (13) > **č^worχ* (16) > **č^horχ* (18) > **č^hork'* (19) = *č'ork'*.

**pH₂tēr* > **φaθir* (10) > **haθir* (12a) > **hayir* (13a) > *hayr* (16).

**pH₂tros* > **patroh* (5) > **φaθroh* (10) > **φaθroχ* (11c) > **hafroχ* (12b) > **hawroχ* (13b) > **hawrχ* (16), anal. *hawr*.

**swesōr* > **hwehōr* (5) > **hwehur* (7) > **h^weur* (10) > **χ^weur* (11b) > **χ^woyr* (16) > **χoyr* (18) > *k'oyr* (19).

**swekūrā* > **swešura* (3) > **šwešura* (4) > **swesura* (6) > **sχ^wesura* (11a with unvoiced *γ^w* after *s*) > **sχ^wesur* (16) > **sχesur* (18) > *skesur* (19 with *k*, not *k'*, after *s*).

**H₃ektō* > **H₃ktō* (with zero grade from the ordinal) >> **optō* (cf. Elean Greek *ὀπτό*) > **oφt'u* (10) > **oft'u* (12) > **owt'u* (13) = **ut'u* (13) > **ut'* (16) > *ut'* (19).

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Bibliographical abbreviations

- AArmL* - *Annual of Armenian Linguistics*.
- APILKU* - Arbejdspapirer udsendt af Institut for Lingvistik, Københavns Universitet.
- BSL* - *Bulletin de la Société de Linguistique de Paris*.
- IF* - *Indogermanische Forschungen*.
- JAOS* - *Journal of the American Oriental Society*.
- Kl.S.* - *Kleine Schriften*.
- KZ* - *Zeitschrift für vergleichende Sprachforschung auf dem Gebiete der indogermanischen Sprachen (Kuhn's Zeitschrift)*.
- MSL* - *Mémoires de la Société de Linguistique de Paris*.
- MSS* - *Münchener Studien zur Sprachwissenschaft*.
- NTS* - *Norsk Tidsskrift for Sprogvidenskap*.
- REArm* - *Revue des Études Arméniennes (n.s.)*.
- SCauc* - *Studia Caucasica*.