

WILLIAM R. SCHMALSTIEG

LITHUANIAN *a* AND THE EVOLUTION OF THE INDO-EUROPEAN VOCALIC SYSTEM

In an article published in 1973 I proposed that within Indo-European there took place monophthongizations of certain diphthongs leading to the following results:

Original Form	Pre-Vocalic Form	Pre-Consonantal Form
** <i>-ow</i>	* <i>-ow</i>	* <i>-ō</i>
** <i>-oy</i>	* <i>-oy</i>	* <i>-ē</i>
** <i>-ew</i>	* <i>-ew</i>	* <i>-ū</i>
** <i>-ey</i>	* <i>-ey</i>	* <i>-ī</i>
** <i>-ay</i>	* <i>-ay</i>	* <i>-ā</i>
** <i>-aw</i>	* <i>-aw</i>	* <i>-ō</i>

Presumably these monophthongizations took place originally only in closed syllables, so that the original monophthongs were free to continue their existence in case they occurred in an open syllable, which later may have become closed as a result of the loss of a following vowel, i. e., e. g., perhaps a reconstructed **leik^w-* 'to leave' eventually derives from ***léyek^w-*.

I would not go into all the details of the 1973 article quoted here, but it seems to me that the assumption of the action of such a 'law of open syllables' within Indo-European explains a number of morphophonemic alternations observed in the individual Indo-European languages.

Thus, for example, the assumption of a passage of ***-oy* to **-ē-* within Indo-European gives an explanation for the Indo-European verbal class with **-ē-* in certain infinitive forms vs. **-oy-* (alternating with **-ye/o-*) in the present tense. Thus Lat. *sed-ē-re*, Slavic *sěd-ě-ti*, Lith. *sėd-ė-ti* 'to sit' reflect an earlier **sěd-oy-* in pre-consonantal position, the etymological **-oy-* from pre-vocalic position still being evident in the Gothic 3rd sg. *hab-ái-þ* 'has'. Etymological **-oy-* was originally to be found in the 2nd sg., 3rd sg., and 2nd pl., the alternative form **-ye/o-* in the 1st sg., 1st pl. (and perhaps in the 3rd pl.). I assume that an etymological suffix ***-óye/o* passed to **-óy-*, whereas the suffix form with the stress on the second syllable, ***-oyé/ /ó-* passed to **-yé/ /ó-*. A similar distribution of vocalism was probably originally

to be noted in the root verbs with no suffix, evidence for which is provided by the present conjugation of Latin *sum*. (The distribution of root vocalism shown by Skt. *ás-mi* 'I am' vs. *s-más* 'we are' with full grade in the singular and zero grade in the plural is a later morphologization to point up the singular-plural contrast.) The original distribution is shown in the following scheme:

	Singular	Plural
1st	** <i>-oyé/ó</i> > <i>*-ye/o</i> (Goth. haba , Lat. sum)	** <i>-oyé/ó</i> > <i>*-ye/o</i> (habam , sumus)
2nd	** <i>-óye/o</i> > <i>*-oy</i> (habáis , es)	** <i>-óye/o</i> > <i>*-oy</i> (habáiþ , estis)
3rd	** <i>-óye/o</i> > <i>*-oy</i> (habáiþ , est)	?

The assumed passage of ****-oy-** > ***-ē-** will also explain the apparent anomalies of the declension of Skt. *rās* 'abundance, riches' (=Lat. *rēs* 'thing'). Let us assume that the original root of this word was **roy-* and that it was a consonant stem noun which was being transferred into the **i-* stem category in Sanskrit. We can reconstruct the paradigm as I did in 1973, 112:

	Singular	Plural
Nom.	<i>*roy-i-s</i>	<i>*roy-y-es</i>
Acc.	<i>*roy-i-m</i>	<i>*roy-y-ns</i>
Instr.	<i>*roy-y-ē</i>	<i>*roy-i-bh-</i>
Dat.	<i>*roy-y-o/ei</i>	<i>*roy-i-bh-</i>
Gen./Abl.	<i>*roy-y-e/os</i>	<i>*roy-y-ōm</i>
Loc.	<i>*roy-y-i</i>	<i>*roy-i-s(i/u)</i>

In the following paradigm we encounter the retention of the **-oy-* before the vowel **-i-*, but its passage to **-ē-* before the consonant **-y-*, giving then:

	Singular	Plural
Nom.	<i>*roy-í-s</i>	<i>*r^é-y-es</i>
Acc.	<i>*roy-í-m</i>	<i>*r^ē-y-ńs</i>
Instr.	<i>*r^ē-y-ě</i>	<i>*ro-y-í-bh-</i>
Dat.	<i>*r^ē-y-ó/éi</i>	<i>*ro-y-í-bh-</i>
Gen./Abl.	<i>*r^ē-y-é/ós</i>	<i>*r^ē-y-ōm</i>
Loc.	<i>*r^ē-y-í</i>	<i>(*roy-í-s[i/u])</i>

With the merger of Indo-European **ō* with Sanskrit *a* and the merger of **ē* with Sanskrit *ā* we get the paradigm:

	Singular	Plural
Nom.	<i>ray-i-ḥ</i>	<i>rā-y-aḥ</i>
Acc.	<i>ray-i-m</i>	<i>rā-y-áh</i>
Instr.	<i>rā-y-á</i>	<i>ray-i-bhiḥ</i>
Dat.	<i>rā-y-é</i>	
Abl.	<i>rā-y-áh</i>	
Gen.	<i>rā-y-áh</i>	<i>rā-y-ám</i>
Loc.	<i>rā-y-í</i>	?(attested <i>rāsu</i> < <i>*rēsu</i> < <i>*roy-</i> <i>su</i>)

The forms given above are **i*-stem forms, but we also find such consonant stem forms as Skt. *rās* = Lat. *rēs* (< **roys*), Skt. *rām* = Lat. *rem* (< **roym*). As I mentioned in 1973, 113: "Older etymological forms are retained as the second element of compounds, cf., e. g., the zero grade of the root in Skt. *bṛhad-ri* 'possessing much riches', dat. sg. *bṛhad-raye*..."

The envisioned monophthongization of **-oy-* > **-ē-* also explains the existence of the Latin doublets *volpēs/volpis* 'fox', *vatēs/vatis* 'seer', *rupēs/rupis* 'rock', the Lithuanian doublets *bitė́/bitis* 'bee', *musė́/musis* 'fly', *kùmsťė́/kùmsťis* 'fist', etc. These stems in **-ē* are perhaps related to Hittite words in *-aiš*, such as *hurtaiš* 'curse', *zahḥaiš* 'battle'.

An assumed passage of **ow* > **ō* explains the morphophonemic alternation **ow/ō* in the root for 'to give' for which I propose the proto-form **dow-* for pre-vocalic position, cf., e. g., the Gk. Cypr. aor. inf. $\delta\omicron\bar{\nu}\epsilon\nu\alpha\iota$, Umbrian *purdou-itu* 'porricitō', Faliscan *douiad* 'duit', Lith. pret. *dāv-ė* 'gave', etc. vs. the proto-form **dō-* for pre-consonantal position, cf., e. g., Gk. $\delta\acute{\iota}\delta\omega\mu\iota$ 'I give', Lith *dúo-ti* 'to give', etc.

Another example of this same morphophonemic alternation is furnished by the root **ġnow-* 'to know', which we find attested in the pre-vocalic form in Gk. $\acute{\alpha}\gamma\nu\omicron\acute{\epsilon}\omega$ < **agnoFéō* but in the pre-consonantal form **ġnō-* in Lat. *cognosco*, Gk. $\gamma\acute{\iota}\gamma\nu\acute{\omega}\sigma\kappa\omega$. A form such as Skt. *jajñau* represents a contamination of the pre-vocalic **ġnow* and the pre-consonantal **ġnō*.

The Indo-European root for 'cow', **g^wow* gave such forms as the Latin gen. sg. *bōv-is*, dat. sg. *bōv-i*, the Gk. gen. sg. $\beta\omicron\bar{\nu}-\acute{\omicron}\varsigma$, dat. sg. $\beta\omicron\bar{\nu}-\acute{\iota}$ but the nom. sg. forms such as Lat. *bōs*, Doric Gk. $\beta\acute{\omega}\varsigma$ derive from the pre-consonantal form of the root which is to be reconstructed as **g^wō-* (< **g^wow-* in pre-consonantal position).

The passage of **-ey-* to **-ī-* is to be found in the denominative class of verbs similar to the **-oy-* (**-ē-*) verbs discussed above. The distribution of the vocalism is exactly the same, i. e., **-ye/o* in the 1st singular and plural (and perhaps the 3rd plural), but **-ey-* > **-ī-* in the other forms of the present conjugation.

Gothic verbs of the type *sôkja* 'I seek', contain the original distribution; in Latin verbs of the type *audiō* 'I hear' the 1st plural has been straightened out to agree with the rest of the paradigm and in Slavic verbs of the type *nositi* 'to carry' apparently only the 1st singular retains the original **ye/o* vocalism:

	Singular			Plural		
	Gothic	Latin	Slavic	Gothic	Latin	Slavic
1st	<i>sôkja</i>	<i>audiō</i>	<i>nošq</i>	<i>sôkjam</i>	<i>audimus</i>	<i>nosimž</i>
2nd	<i>sôkeis</i>	<i>audis</i>	<i>nosiši</i>	<i>sôkeiþ</i>	<i>auditis</i>	<i>nosite</i>
3rd	<i>sôkeiþ</i>	<i>audit</i>	<i>nositž</i>	<i>sôkjand</i>	<i>audiunt</i>	<i>nosetž</i>

(But Polish *nosz-q* 'they carry' could be an archaism from **nos-jq-tž* [cf. Goth. *sôk-jand*], although it is usually explained as an innovation).

Gothic verbs of the first weak class with an etymologically short vowel in the root syllable were completely assimilated to the **ye/o*-stem type, cf. Gothic *nasja* 'I save', etc. This Gothic verbal class represents a syncretism of the etymological **ye/o* verbs (with the suffix **-y-* generalized in position next to the root) and the old **i*-verbs.

It now appears necessary to me to reconstruct some kind of plausible models of the evolution of a vocalic system to explain just how such changes may have taken place. In attempting to reconstruct such a system I have found it necessary to abandon one of the proposed monophthongizations, viz. the monophthongization of **ay* > **ā*. I have done so because I am unable to see how the monophthongization of **oy* > **ē* could have taken place without having crossed the articulatory path of **ay*, which in my proposed theory has been monophthongized to **ā*. As far as I know, in those languages where etymological **oy* has been monophthongized to **ē* it has passed through a stage of **ay*. It is fairly easy to find examples of the monophthongization of **ay* > *ā*, cf., e. g., Gothic *stains* beside Old English *stān*. See Prokosch, 1938, 106, who says: "In Old English, *ai* had become *ā* before the time of our earliest documents". Other examples of the monophthongization of **ay* > *ā* are attested in Lithuanian dialects, e. g., Zinkevičius, 1966, 90, reports that sometimes Samogitian Lithuanian dialects monophthongize standard Lith. *ai* to *ā*, thus *vā'ks* beside standard Lith. *vaikas* 'child'. But I do not know of any case where both **ay* > *ā* and **oy* > *ē* at the same time.

Evidence for a morphophonemic alternation of the type **ay* vs. **ā* includes some of the following etymologically related forms: Slavic *stoj-ati* 'to stand' (< < **stay-*) vs. *stā-ti* 'to stand up, to become'; the stem alternation **ā/ay* in **ā*-stem nouns, cf. Gk. nom. sg. γυνή 'woman' vs. voc. sg. γύναι, the Gk. alternative stem γυναι- in the gen. sg. γυναικ-ός, dat. sg. γυναικ-ί, etc. and the Armenian nom. sg.

kin 'woman' vs. the nom. pl. *kanayk̄*. A stem **gnay* in state two could explain Skt. *gnā* and in state one *jani-* 'wife'. Sanskrit **ā*-stem nouns seem to show this type of morphophonemic alternation in declension, cf. the instr. sg. *sen-ay-ā* vs. the nom. sg. *sen-ā* 'army'.

Reichert, 1909, 197, lists the following paradigm for the Avestan word *daēnā*- (superscript 1 = 'inneres Wesen', superscript 2 = 'religion'):

	Singular	Plural
Nom.	¹ <i>daēnā</i> ² <i>daēnā</i>	¹ <i>daēnā̎</i>
Acc.	¹ <i>daēnəm</i> ² <i>daēnəm</i>	¹ <i>daēnās-čā</i>
Instr.	¹ <i>daēnā</i> ² <i>daēna</i> ¹ <i>daēnayā</i> ² <i>daēnaya</i>	¹ <i>daēnābīš</i>
Dat.	¹ <i>daēnayāi</i>	¹ <i>daēnābyō</i>
Gen.	² <i>daēnayā̎</i>	
Abl.	² <i>daēnayāt</i>	
Voc.	² <i>daēnē</i>	

From the preceding one can see the distribution with the stem form *-ay-* before the vocalic endings, e. g., the instr. sg. ¹*daēn-ay-ā*, dat. sg. ¹*daēn-ay-āi*, and the stem form *-ā-* before the consonantal endings, e. g. acc. pl. ¹*daēn-ā-s* (*-čā*), instr. pl. ¹*daēn-ā-bīš*. The voc. sg. ending *-e* can be compared with the Gk. voc. sg. γύναι and the Sanskrit voc. sg. *sen-e*, all of which seem to derive from **-ay* from pre-vocalic sandhi position. One also notes the stem form **-ay-* in the Slavic instr. sg. (*žen-*)*oj-o* '(with the) wife, woman'.

Proponents of the laryngal theory may wish to see here some kind of laryngal which has left its trace as *-y-* in intervocalic position, but lengthened the preceding vowel in pre-consonantal position. If an explanation must be found, however, I would rather assume that both **ǎ-* and **ā-* stem nouns existed in Indo-European. Such a state of affairs seems to be directly reflected in Greek where we find such **ǎ*-stem nouns as μούσα 'Muse', γέφυρα 'bridge', etc., in addition to **ā*-stem nouns such as χώρα 'land, people'. Perhaps the Balto-Slavic vocatives represented by such nouns as Lith. *gálv-a* and Slavic *glav-o* also contain an etymological **ǎ*.

I would propose then that the **-y-* in the sequence **-ay-* represents a hiatus filler between stem and ending for the **ǎ*-stem nouns and that at a later date in the history of the Indo-European languages the **ǎ-* and **ā-* stem nouns merged completely.

Now the preceding has been written from the point of view of the traditional statements about the Indo-European vocalic system. In the following discussion I will suggest that the phoneme represented in the traditional Indo-European grammars by the vowel **ō* was really ***ǎ* originally and that the **ā* of traditional Indo-European grammars was really ***ǣ* originally. In all of the Indo-European languages etymological ***ǣ* passed to **ā* and etymological ***ā* passed to **ō*, but in some of the Indo-European languages ***ǎ* did not indeed pass to **ō*. For example, then, Lithuanian *ā* represents Indo-European **ǎ* (and **ǣ*), whereas Greek *ā* represents Indo-European **ǣ* and Greek *o* represents Indo-European **ǎ*.

I shall undertake now to sketch a possible model for the internal evolution of the Indo-European vocalic system. As far as possible, I will show existing vocalic systems which are, at least, similar to the various stages of development which I shall propose for Indo-European.

I shall begin by pointing out that Hockett, 1955, 85, proposes the following vocalic system for the Filipino languages Ilocano and Dibabaon:

<i>i</i>	<i>u</i>
	<i>ə</i>
	<i>a</i>

I might suggest a system like this for the earliest period of Indo-European, but I would add the correlate of vocalic length for Indo-European, thus:

	I	
<i>ĩ</i>		<i>ũ</i>
	<i>ǣ</i>	
	<i>ǎ</i>	

This earliest step is not necessary for the further development which I am going to suggest, but one could suppose that qualitative ablaut had its origin at this stage. How this finally shows up as **ē* vs. **ō* will become evident as one follows the evolution of the vocalic system as I imagine it below. I propose that there existed syllables of the type *[C]ǎC. If such a syllable were immediately followed by the suffix *-i(*-y) the vowel **ǎ* was fronted to **ē* giving an originally allophonic *[C]ēC(-i, -y). At a later date this suffix *-i(-y) was lost, thereby rendering the contrast **ē* vs. **ǎ* phonemic. In the reconstruction below ***ē* finally turns up as **ē* and ***ǎ* as **ō*, so that the **ō*-grade ablaut would somehow be the fundamental grade and the **ē*-grade the derivative grade, i. e., reflecting an early suffix *-i(*-y), later lost completely, its original existence attested only by *ē*-grade ablaut at a later stage. Although the *ē*-grade ablaut may be fundamental from the point of view of the attested Indo-European languages, one should not be surprised at this. It frequently happens that the derivative form of one stage of a language appears to be the fundamental form at a later stage.

I would now call to the reader's attention the vocalic system of Potawatami as described by Hockett, 1955, 85:

<i>i</i>	<i>ə</i>	<i>o</i>
<i>e</i>		<i>a</i>

Hockett says: "The mid central vowel /ə/ varies more widely from one environment to another than the other four, but there is no reason to set it off as constituting a special subsystem by itself". For the second Indo-European stage I would suggest a system similar to this one, except that I would assume short and long vowels. Differently from Potawatami, however, I assume that Indo-European had contrasts of length and that the high back vowel was /*ū*/ rather than /*o*/.

	II	
<i>ī</i>		<i>ū</i>
	<i>ǣ</i>	
<i>ē</i>		<i>ā</i>

The so-called diphthongs would consist of vowel plus **y* or **w*. The question of the 'long diphthongs' remains open. I do not know whether at this stage there was a long vowel plus the final elements **y*, **w*, or whether, perhaps, there was a contrast of intonation which carried the phonemic difference between etymologically short and long vowel plus **y*, **w*. In other words I would assume that there existed **ey*, **əy*, **ay*, **ew*, **əw*, **aw*, but I would not know whether there existed the 'long diphthongs' **ēy*, **āy*, **āy*, **ēw*, **āw*, **āw* or not. Instead of 'long diphthongs' as opposed to 'short diphthongs' there may have been acute diphthongs as opposed to circumflex diphthongs: **éy*, **ǣy*, **áy*, etc. vs. **ēy*, **āy*, **āy*, etc.

During stage II perhaps certain of the allophones of **ǣ* were close to **ī* and perhaps under some circumstances this **ǣ* merged with **ī* in those dialects which finally became the Indic languages and thus we have the well-known equation of Indic *ī* = *ā* of the European languages. I personally, however, am more inclined to agree with Burrow, 1965, 105 who writes: "If this *ə* had been confined to the comparatively few words in which Sanskrit *i* appeared to correspond to *a* in the other languages, it would never have acquired very great importance in Indo-European theory. It was due to its becoming a basic element in the early theories of apophony that it acquired such importance in the traditional theory of Indo-European. In the comparative dictionaries this *ə*, so insecurely founded, appears in the utmost profusion in IE reconstructions, particularly in the case of the so-called disyllabic roots. Skt. *i* is also suffixal when it appears after such roots and the H which constituted the final element of the root is elided (*táritum* < **tarH-itum*).

The theory of apophony was further complicated by the invention of original long diphthongs, possessing a weak grade ∂i which was held to have developed into \bar{i} (sometimes into $-ay-$), but there is nothing in the facts to justify the assumption of such long diphthongs or of the weak grades which are supposed to be derived from them."

Although at this stage I would not consider the diphthongs as separate phonemic entities, I would assume that the initial phoneme of the biphonemic sequence was considerably influenced by the second phoneme. Thus the $*e$ in the diphthong $*ey$ was raised and fronted under the influence of the following $*y$, the $*e$ of the diphthong $*ew$ was raised, backed and rounded under the influence of the following $*w$. The diphthong $*ay$ was fronted and raised by the following $*y$ and was probably rendered phonetically by $*\epsilon y$. The diphthongs $*aw$ and $*\partial w$ were backed and rounded and probably merged as $*ow$ under the influence of the following $*w$. Thus we can enter the diphthongs in stage II in the following way:

\bar{i}		\bar{u}
ey		ew
\bar{e}	$\partial y \bar{\partial}$	$ow (< *aw, *ow)$
$\epsilon y (< *ay)$	\bar{a}	

From the morphological point of view it would be convenient now to assume a merger of $*\partial y$ with $*\bar{\partial}$ in preconsonantal position, since, as will be seen below I assume that finally $*\bar{\partial}$ passed to $*\bar{a}$. In other words, if one could assume that $*\partial y$ passed to $*\bar{\partial}$, then the morphophonemic alternation of $*ay$ vs. $*\bar{a}$ could be explained on a phonological basis. As I have stated above, my only reason for rejecting this merger is that a merger of $*\partial y$ and $*\bar{\partial}$ does not seem likely from the phonological point of view, particularly in a system in which the first element seems to be assimilating in the direction of the final element rather than vice-versa. Thus one would expect $*\partial y$ to pass to $*\epsilon y$ rather than to $*\bar{\partial}$. The following monophthongizations represent the principle enunciated by Labov, Yaeger and Steiner, 1972, 228, that, "In chain shifts, maximally open upgliding diphthongs may become tense or long monophthongs". The diphthongs give us then the following long vowels:

IIIA

$\bar{i} (< *ey)$	$\bar{u} (< *ew)$
$\bar{e} (< *ey < **ay, **\partial y)$	$\bar{o} (< *ow < **aw, **\partial w)$

At the same time in the long vowel system the $*\bar{\partial}$ was lowering and moving into the position of the $*\bar{a}$, which was thereby simultaneously being backed, raised and rounded to the position of $*\bar{o}$ where it merged with that $*\bar{o}$ deriving from the diphthong $*ow (< **aw, **\partial w)$. The falling of $*\bar{\partial}$ to \bar{a} conforms to the principle

of Labov, Yaeger and Steiner, 1972, 106 that, "In chain shifts, non-peripheral vowels usually fall". The long vowels which do not derive from diphthongs are given in the schema below:

IIIB

$$\begin{array}{ccc} \bar{i}(< *i) & & \bar{u}(< *u) \\ & \bar{e}(< *e) & \bar{o}(< *a) \\ & & \bar{a}(< *a) \end{array}$$

Combining IIIA and IIIB we get the following schema:

IIIC

$$\begin{array}{ccc} \bar{i}(< *i, *ey) & & \bar{u}(< *u, *ew) \\ \bar{e}(< *e, *ey < **ay, **ay) & & \bar{o}(< *a, *ow < **aw, **aw) \\ & & \bar{a}(< *a) \end{array}$$

A phonological explanation for the morphophonemic alternation $*ay$ vs. $*\bar{a}$ could perhaps still be saved if one were to assume that at the stage when all the other diphthongs were being monophthongized, the diphthong $*ay$ was not monophthongized, but was rather lowered to $*ay$ at the time when $*\bar{a}$ was being lowered to \bar{a} . It could then be assumed that the monophthongization of $*ay$ ($< *ay$) to $*\bar{a}$ in closed syllables took place after the earlier monophthongization of $*ay$ ($< **ay$) to \bar{e} in the same environment.

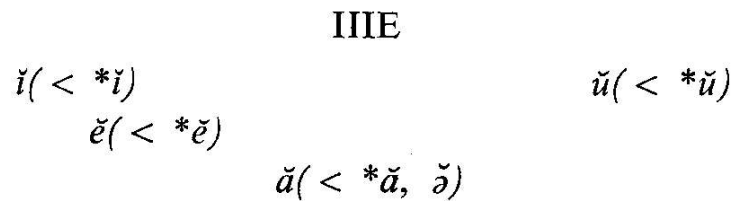
The short vowel system follows closely the evolution of the long vowels, but there is one major difference: there are certain Indo-European languages which merge $*\check{a}$ with \check{a} , whereas in other languages the $*\check{a}$ passed to \check{o} just as $*\bar{a}$ passed to \bar{o} . In other words, certain Indo-European languages maintain the distinction between $\check{a}(< *a)$ and $\check{o}(< *a)$ whereas other Indo-European languages merge the two vowels. Thus, strictly speaking, we should not talk of the retention of \check{o} vs. its loss or merger with \check{a} . The etymological \check{o} was originally $*\check{a}$. In Greek, Italo-Celtic and Armenian etymological $*\check{a}$ passed to \check{a} and etymological $*\check{a}$ passed to \check{o} giving the short vowel system for the southern Indo-European languages. Thus we have the schema:

IIID

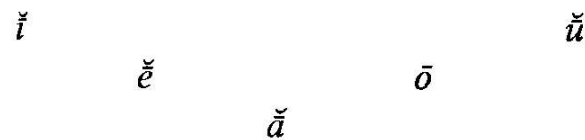
$$\begin{array}{ccc} \check{i}(< *i) & & \check{u}(< *u) \\ & \check{e}(< *e) & \check{o}(< *a) \\ & & \check{a}(< *a) \end{array}$$

In the short vowel system given above we see an exact parallel to the long vowel system IIIB. On the other hand in the northern Indo-European languages such

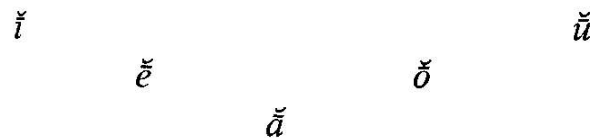
as Germanic and Balto-Slavic the etymological **ǣ* kept its old articulatory position and was not raised, backed and rounded as was its long counterpart. Thus the short vowel system for these languages was:



For Indo-European we can reconstruct two slightly different vowel systems, more or less on an areal basis, viz. a northern Indo-European system (combining IIIC and IIIE):



and a southern Indo-European system (combining IIIC and IIID)



Since Indo-Iranian merges **ě*, **ō̄*, **ǣ* as *ǣ*, it is impossible to decide whether to class it with the northern or southern group of languages.

But one of the major isoglosses separating northern and southern Indo-European is whether the old **ǣ* remained in its original position at the bottom of the vowel triangle merging with the **ǣ̄* which was lowering into that position or whether the **ǣ̄* moving into the position of the old **ǣ* pushed this old **ǣ* into the **ō̄* position. Thus Balto-Slavic and Germanic reflect an archaism, i. e., **ǣ* remained at the bottom of the vowel triangle. And in fact this is the reason that contemporary Lithuanian does not have a native short **ō̄*.

Slavic evidence for the retention of an Indo-European **ō̄* is to be discounted, see my 1971 and 1972 articles listed in the references. The Slavic system developed as follows from the northern Indo-European system IIIC and IIIE above. The first step was the merger of **ō̄* and **ǣ̄* leading to the Proto-Slavic system shown below:



The next step shows the monophthongization of the diphthongs within Slavic and the fronting and delabialization of $*\bar{u}$ to \bar{y} . The long vowel system is presented below:

VA

\bar{i} (< $*\bar{i}$, $*ei$, sometimes $*ai$)	\bar{y} (< $*\bar{u}$)	\bar{u} (< $*au$)
\bar{e} (< $*\bar{e}$, $*ai$)		\bar{a} (< $*\bar{a}$)

The nasal usually written as ϱ is really $*\bar{u}$ and the nasal usually written as ϵ is either $*\bar{e}$ or $*\bar{i}$. The Slavic short vowel system at this stage is given below:

VB

\check{i} (< $*\check{i}$)	\check{u} (< $*\check{u}$)
\check{e} (< $*\check{e}$)	\check{a} (< $*\check{a}$)

Combining both the short and the long vowel systems we get:

VC

\check{i}	\bar{y}	\check{u} (\bar{u})
\check{e} (\bar{i} or \bar{e} ?)		\check{a}

In the next period certain of the original contrasts in length were neutralized giving the schema below:

VI

i (< $*\bar{i}$)	y (< $*\bar{y}$)	u (< $*\bar{u}$) [u]
b (< $*\check{i}$)		\bar{o} (< $*\check{u}$)
e (< $*\check{e}$) [ϵ]		o (< $*\check{a}$)
\check{e} (< $*\bar{e}$)		a (< $*\bar{a}$)

The Slavic o then must be derived from a short $*\check{a}$ and therefore furnishes no evidence for Indo-European $*\check{o}$. A further indication that the Slavic $*\check{o}$ derives from $*\check{a}$ is the fact that the diphthong $*ai$ passes to $*\bar{e} > \check{e}$. The passage of $*oi > \check{e}$ is difficult to imagine phonologically without an intermediate step such as $*ai > *\bar{e}$. The assumption that there ever was an $*\check{o}$ in Lithuanian or in any of the northern Indo-European languages must be based then on evidence particularly from Greek and Latin and to some extent from Celtic, Armenian and Tokharian. One usually quotes, for example, Old Irish *ocht* 'eight', Lat. *octo*, Gk. ὀκτώ, Old Irish *roth* 'wheel', Lat. *rota*, Old Irish *orbe* 'inheritance', in contrast to Old Irish *ad'aig* 'drives, moves', Lat. *agere*, Gk. ἄγειν, Old Irish *an(a)id* 'remains', Skt. *ániti* 'breathes', Goth. *uz-anan* 'to exhale'.

There may be some evidence for $*\check{o}$ in Tokharian also. According to Krause-Thomas, 1960, 57, "Idg. o liegt vor in A *okät* [B *okt*]; AB *or* [B Pl. *ārwa*] < idg.

*(d)oru (vgl. zum Anlautswechsel idg. *(d)akru 'Träne'); A *orkäm* [B *orkamo*] wohl ablautend (und mit Fernassimilation) zu gr. ἔρεβος, got. *riqis* 'Finsternis' usw. neben A *arkant-* [B *erkennt-*] 'schwarz'; A *kolye* [B *kolyi*] 'Schwanzhaar' zu arm. *kor* 'Stengel'; A *kosne* [B *kos*] wohl zu idg. *q^uo-. I do not know how exactly to evaluate the Tokharian evidence, although in this case it does not seem excessively strong to me.

In Armenian we find, e. g., *otn* 'foot', cf. Gk. πόδα < *podn, *hot* 'odor', cf. Gk. ὀδμή, Lat. *odor*. Meillet, 1936, 41, notes, however, "Pour quelques mots on s'est demandé si i. -e. *ǫ n'y serait pas représenté par arm. *a*, mais, comme il est impossible de faire entrer ces cas dans une règle, on ne saurait admettre qu'il s'agisse d'un ancien *o*; par exemple l'*a* de *akn* 'œil' doit être un ancien **a* substitué à un degré vocalique sans *e* de l'initiale, cf. l' *a* de lat. *aurēs* 'oreilles' en regard de l'*o* du génitif homér. οὔρατος".

At this point I should like to say a few words about some of William Labov's (1972) findings concerning changes in phonological systems. Labov finds that in the operation of sound change some words in certain word classes do not undergo the expected phonological change. For example, according to Labov, 1972, 107, in Philadelphia English monosyllabic words ending in anterior voiceless fricatives raise [æ] to [ɛ:²] in the words *pass*, *bath* and *laugh*, but not in the word *cash*. Labov continues, "The corresponding rule in New York City affects all voiced stops as well, but in Philadelphia, only three such words, all ending in *-d*, are involved. These are *bad*, *mad* and *glad*, contrasting [ɛ:²] with lax [æ] in *pad*, *grab*, *Brad*, etc. We might try to rationalize this decomposition by saying that 'common adjectives' are affected, but this attempt fails because *sad* is always pronounced with [æ] in this dialect...".

Labov believes the Philadelphia situation to be rare, but he finally admits (109–110): "No matter how many new subclasses and new conditioning features we discover, there will most likely be a residue of exceptions and non-conforming items. Examples can be found in any thorough historical investigation...". Labov then gives an example from the reconstruction of Proto-Lolo-Burmese, an example, which I feel unnecessary to repeat here, since many examples can be found throughout the history of various language families.

I am of the opinion then that in the course of any sound change some words straggle behind the main stream of the change in progress and perhaps never catch up with the rest of the words. Such laggard words will always reflect an earlier pronunciation. I assume then that reflexes of *ǫ in some Indo-European languages where *ǫ should have passed to *ǫ* may reflect such laggard words. This would explain, for example, such aberrant forms as Latin *aurēs* 'ears' (beside the Gk.

gen. sg. ὀστρος) and Armenian *akn* 'eye' beside the expected *ō* in *hot* 'odor'. Similarly such forms as Latin *dā-mus* 'we give' and Armenian *tam* 'I give' could well represent an Indo-European root **dā-* which failed to pass to the expected **dō-*. Perhaps we expect **dō-* only on the basis of Gk. δο-τρος, etc. The form **dō-* derives, of course, from **da-w* in pre-consonantal position.

My conclusion is then that it is unnecessary to assume that Baltic (or northern Indo-European) **ā* ever was anything but **ā* (or perhaps in some cases ***ā̃*). Proto-Indo-European ***ā* passed to **ō*, as ***ā̃* dropped to **ā*, but in Baltic and northern Indo-European in general ***ā* remained as **ā* (rather than passing to **ō* as it did in most cases in southern Indo-European) and merged with the new **ā* which derived from earlier ***ā̃*.

REFERENCES

- Burrow, T. 1965. The Sanskrit language, 2nd ed. Glasgow, The University Press.
- Hockett, Charles F. 1955. A manual of phonology. = Part 1, International Journal of American Linguistics, Vol. 21, No. 4., Baltimore, Linguistic Society of America.
- Krause, W. and Werner Thomas. 1960. Tocharisches Elementarbuch, Heidelberg, Carl Winter.
- Labov, W. 1972. The internal evolution of linguistic rules. In Stockwell, Robert P. and Ronald K. S. Macaulay, Linguistic change and generative theory, Bloomington and London, Indiana University Press.
- Labov, W., Malcah Yaeger and Richard Steiner. 1972. A quantitative study of sound change in progress. Vol. I. Report on National Science Foundation Contract NSF-GS3287, Philadelphia, U. S. Regional Survey, 204 N. 35th St.
- Meillet, A. 1936. Grammaire comparée de l'arménien classique, Seconde édition, Vienna, Imprimerie des pp. mekhitharistes.
- Prokosch, E. 1938. A comparative Germanic grammar, Baltimore, Linguistic Society of America.
- Reichelt, H. 1909. Awestisches Elementarbuch, Heidelberg, Carl Winter. (1967 reprint.)
- Schmalstieg, W. R. 1971. Die Entwicklung der *ā*-Deklination im Slavischen, — ZfslPh XXXVI (1971) 130–146.
- , 1972. Baltų ir slavų kalbų vokalizmo sistemos raidos chronologija, Baltistica, I priedas. 159–164.
- , 1973. New thoughts on Indo-European phonology, KZ 87. 99–157.
- Zinkevičius, Z. 1966. Lietuvių dialektologija, Vilnius, Mintis.