## Vowels, Sonorants, Ablaut, and Laryngeals

### 1. Vowels

<table>
<thead>
<tr>
<th>Sanskrit</th>
<th>Greek</th>
<th>Latin</th>
</tr>
</thead>
<tbody>
<tr>
<td>asti</td>
<td>esti</td>
<td>est</td>
</tr>
<tr>
<td>aśva</td>
<td>equus</td>
<td>‘horse’</td>
</tr>
<tr>
<td>sána</td>
<td>senex</td>
<td>‘old’</td>
</tr>
<tr>
<td>mādḥya</td>
<td>mesos</td>
<td>medius</td>
</tr>
<tr>
<td>ávi</td>
<td>ois</td>
<td>ovis</td>
</tr>
<tr>
<td>ápas</td>
<td>opus</td>
<td>‘work’</td>
</tr>
<tr>
<td>ánas</td>
<td>onus</td>
<td>‘burden’</td>
</tr>
<tr>
<td>ma:ś</td>
<td>me:n</td>
<td>mensis</td>
</tr>
<tr>
<td>sa:mi</td>
<td>he:mi-</td>
<td>semi</td>
</tr>
<tr>
<td>va:k (‘speech’)</td>
<td>vo:x</td>
<td>‘voice’</td>
</tr>
<tr>
<td>pá-</td>
<td>po:no</td>
<td>po:tus</td>
</tr>
</tbody>
</table>

* e > a : e : e
* o > a : o : o

New pattern:

<table>
<thead>
<tr>
<th>Sanskrit</th>
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<th>Latin</th>
</tr>
</thead>
<tbody>
<tr>
<td>pitá</td>
<td>patér : páter</td>
<td>‘father’</td>
</tr>
</tbody>
</table>

* e > i : a : a

### 2. Sonorants

<table>
<thead>
<tr>
<th>Sanskrit</th>
<th>Greek</th>
<th>Latin</th>
</tr>
</thead>
<tbody>
<tr>
<td>*m maːtār</td>
<td>méːte:r</td>
<td>maːter</td>
</tr>
<tr>
<td>*m dáša</td>
<td>déka</td>
<td>dekem</td>
</tr>
<tr>
<td>*n návas</td>
<td>néos</td>
<td>nowus</td>
</tr>
<tr>
<td>*n tatás</td>
<td>tatós</td>
<td>tentus</td>
</tr>
<tr>
<td>*l lagʰ ūs</td>
<td>elakʰ ūs (‘small’)</td>
<td>lewis</td>
</tr>
<tr>
<td>*l mṛdūs</td>
<td>mollis</td>
<td>‘soft’</td>
</tr>
<tr>
<td>*r rūḍʰ irás</td>
<td>erutʰ rós</td>
<td>ruber</td>
</tr>
<tr>
<td>*r mṛtis</td>
<td>mort-</td>
<td>‘death’</td>
</tr>
<tr>
<td>*w váhati</td>
<td>wekʰ ēto:</td>
<td>wehit</td>
</tr>
<tr>
<td>*u jugám</td>
<td>zugón</td>
<td>jugum</td>
</tr>
<tr>
<td>*j jugám</td>
<td>zugón</td>
<td>jugum</td>
</tr>
<tr>
<td>*i vid-</td>
<td>wid</td>
<td>wid-</td>
</tr>
</tbody>
</table>
3. Ablaut

\*e ~ \*o ~ \*∅

**Sanskrit**  |  **Greek**
---|---
e-grade:  |  várte:  |  ‘I turn’  |  patéra  |  ‘father-ACC’
o-grade:  |  va-várta  |  ‘I turned’  |  apáтора  |  ‘fatherless’
zero-grade:  |  vavṛtimá  |  ‘we turned’  |  patróς  |  ‘father-GEN’

**Latin**

e-grade:  |  tego:  |  ‘I cover’  |  pater  |  ‘father-NOM’
o-grade:  |  toga  |  ‘toga’
zero-grade:  |  |  |  patris  |  ‘father-GEN’

Note: zero-grade of sonorants are either syllabic sonorants (or their reflexes) or high vowels (for *w and *j).

4. Root Types

|  | \*CeC | \*CeRC | \*CReC |
---|---|---|---|
e-grd | o-grd | ∅-grd | e-grd | o-grd | ∅-grd | e-grd | o-grd | ∅-grd |
\*CeC | \*CoC | \*CC | \*CeRC | \*CoRC | \*CRC | \*CReC | \*CRoC | \*CRC |

5. Exceptional Root Types

|  | \*VC | *VRC |
---|---|---|
e-grd | o-grd | ∅-grd |
\*VC | \*oC | \*əC |
\*VRC | \*oRC | \*RC |

ago:  | ógmos  | awso:sa  | uṣás  
‘I drive’  | ‘furrow’  | ‘dawn’  | ‘dawn’  
(Gk.)  | (Gk.)  | (Lat.)  | (Skt.)

\*CV:  
e-grd | o-grd | ∅-grd  
\*CV: | \*Co: | \*Cə  
Note: when there is no sonorant, \*ə shows up in zero-grade

ti-\text{ti}d-\text{-mi}  |  ti:\text{o}mós  
‘I place’  |  ‘place’  
(Gk.)  |  (Gk.)
6. Explaining the Exceptions - Laryngeal Theory

Saussure (1879):

Posited two abstract ‘sonic coefficients’: Q and A

Rules:

\*Ae > *Aa  
\*A > \emptyset  
\*Qe > *\emptyset  
\*Q > \emptyset

\*eA > *a:  
\*eQ > *\emptyset:

e-grade  o-grade  zero-grade

\*AeC > *aC  
\*AoC > *oC  
\*AC > *\emptyset C

\*AeRC > *aRC  
\*AoRC > *oRC  
\*ARC > *RC

\*CeA > *Ca:  
\*CoA > *Co:  
\*CA > *\emptyset C

This analysis simultaneously accounts for the irregular roots and provides a source for *\emptyset

Möller (1917):

Attempted to link IE with Semitic languages and identified Saussure’s sonic coefficients as LARYNGEALS. Subsequently, three such hypothetical consonants were posited:

\*e₁ (e-coloring)  e₂ (a-coloring = A)  e₃ (o-coloring = Q)

Perhaps:

\[x̪\]  \[x\]  \[x\]

Note parallels with the three series of velars reconstructed by Brugmann. While the link with Semitic has been almost universally discounted, the term ‘Laryngeal’ remains (hence, one hears Saussure credited with the ‘Laryngeal Hypothesis’). New evidence (below) suggests that Möller may have been on the right track when he gave Saussure’s sonic coefficients some kind of ‘laryngeal’ phonetic value.

Often, nowadays, the three laryngeals are represented as H₁, H₂, and H₃. Their effects are as follows:

1. a. \([H₁ e \ldots] > [e \ldots]\)  \*H₁es > *es  ‘be’
   b. \([H₂ e \ldots] > [a \ldots]\)  \*H₂eg > *ag  ‘drive’
   c. \([H₃ e \ldots] > [o \ldots]\)  \*H₃ed > *od  ‘smell’
2. a. \([\ldots e H₁] > [\ldots e:\]  \*d₁H₁ > *d₁e:  ‘set’
   b. \([\ldots e H₂] > [\ldots a:]\)  \*steH₂ > *ste:  ‘stand’
   c. \([\ldots e H₃] > [\ldots o:]\)  \*gneH₃ > *gno:  ‘know’

The idiosyncratic vowel in the exceptional roots are the result of the coloring of e-grade *e by different laryngeals.
7. Voiceless aspirated stops in Indo-Iranian

Indo-Iranian had a series of voiceless aspirated stops that caused early researchers to reconstruct a fourth, voiceless aspirated series of stops (*pʰ, *tʰ, *kʰ).

These stops had some peculiar properties:

- Like voiceless unaspirated stops, they correspond to voiceless unaspirated stops in Greek and Latin:
  
  Skr. stʰa: : Grk. hista:mi : Lat. sta:re ‘stand’

- They don’t co-occur with sonorants in initial position (e.g. no pʰl...). If they were single phonemes, this would be unexpected.

- They don’t undergo secondary palatalization (Skr. kʰya:ti ‘sees’, not cʰya:ti).

These can be accounted for if we assume a sequence of a voiceless stop, followed by a laryngeal; the laryngeal is realized as aspiration in Indo-Iranian

*rot-H₂-o > Skr. rotʰa ‘chariot’ cf. Lat. roh-eH₂ > rota:
  
  zero-grade suffix e-grade suffix

- Accounts to correspondence with unaspirated stops in Greek and Latin (laryngeal deletes without aspiration in these languages).

- Lack of initial three-consonant clusters in PIE account for lack of pʰl...

- The laryngeal follows *k, preventing secondary palatalization.

8. Amazing Corroboration

The Laryngeal Hypothesis was largely ignored because it was too abstract and lacked direct evidence. However, Hittite tablets were discovered during WWI; in 1927, Kuryłowicz published evidence for the Laryngeal Hypothesis from Hittite – no evidence for H₁, but evidence for H₂ and H₃:

<table>
<thead>
<tr>
<th>Greek</th>
<th>Latin</th>
<th>Hittite</th>
</tr>
</thead>
<tbody>
<tr>
<td>anti</td>
<td>hanti</td>
<td>‘in front’ H₂</td>
</tr>
<tr>
<td>pa:sko</td>
<td>oahsanzi</td>
<td>‘protect’ H₂</td>
</tr>
<tr>
<td>osteo</td>
<td>haaštai</td>
<td>‘bone’ H₃</td>
</tr>
</tbody>
</table>