Principal Sound Changes from PIE to Greek

1. When 'syllabic' (i.e. not adjacent to a sonority peak, typically), the laryngeals *h₁ *h₂ *h₃ are reflected in Greek as *e*, *a*, *o* respectively. This is the famous *triple* reflection of the laryngeals in Greek.

When in onset position between sonority peaks, the laryngeals are normally lost, but are sometimes reflected through the failure of adjacent vowels to coalesce into a single syllable.

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*h<sub>1</sub>leng<sup>h</sup>-e/o- 'to affirm under oath' > elenk<sup>h</sup>e- 'to cross-examine, insult' *h<sub>1</sub>reh<sub>1</sub>-e/o- 'to ask' > eree- *ph<sub>2</sub>tēr 'father' > patēr *h<sub>2</sub>uedH 'to speak': *h<sub>2</sub>udH-eh<sub>2</sub> > audē 'voice' *kremh<sub>2</sub>-to-i > kremamai 'hangs up' *h<sub>3</sub>reĝ-e/o- 'to direct' > orege- 'to reach for, stretch out for' *h<sub>3</sub>b<sup>h</sup>r(e)uH-s 'eyebrow' > op<sup>h</sup>rūs
```

2. Greek is a centum language: the palatals become velars:

```
*\hat{k} > k, *\hat{g} > g, *\hat{g}^h > *g^h (> k^h)

*de\hat{k}-e/o- 'receive' > deke- 'accept'

*\hat{g}i-\hat{g}neh<sub>3</sub>-s\hat{k}-e/o- 'know, recognize' > gign\bar{o}ske-

*h_1or\hat{g}^h-ei-e/o- 'to mount' > ork^h\acute{e}e- 'to jump, to dance'

*lei\hat{g}^h-e/o- 'to lick' > leik^he-
```

3a. The voiceless stops *p, *t, *k (incl. < * \hat{k}), voiced stops *b, *d, *g (incl. < * \hat{g}), and sonorants (*m *n *l *r) are usually unchanged.

```
*potis 'lord' > potis

*trep-e/o- 'to turn' > trepe-

*sker-i-e/o- 'to clip short' > skeire-

*spend-e/o- 'to make a ritual offering' > spende-

*h_led-e/o- 'to eat' > ede-

*men-e/o- 'to remain' > mene-

*leuk-o-s 'bright' > leukos 'white'
```

3b. The voiced aspirates become voiceless:

3c. By Grassmann's Law, the first of two aspirated segments in a word is deaspirated:

```
*dhi-dheh<sub>1</sub>-mi 'I place, put' > *thi-thē-mi > tithemi *bhordh-ei-e/o- 'destroy' > *phorthee- > porthee- *dheugh-e/o- 'to make useful, produce' > *theukhe- > teukhe- 'to build' *ghebh-el 'head' > *khephal-(ē) > kephal\bar{e}
```

4. The behavior of the labiovelars is a bit complex. Labiovelars become dentals (coronals) or labials under various complex conditions. The ordinary rule is that labiovelars become coronal before *e, and *k^w also becomes coronal before *i. But in plenty of cases the change is not entirely regular, where one word in a paradigm has influenced the development of others.

```
*leik<sup>w</sup>e/o- 'to leave' > leipe- *k<sup>w</sup> > p

*\underline{u}ok<sup>w</sup>-s 'voice' > ops  *k<sup>w</sup> > p (regular)

*\underline{u}ek<sup>w</sup>-os 'word' > epos

*\underline{k}'wi-s 'who' > \underline{t}is  *k<sup>w</sup> > t before *i (regular)

*\underline{t}ieg<sup>w</sup>-e/o- 'to have respect for, to pull back' > \underline{s}ebe- 'to think shame' *\underline{g}" > b

*\underline{b}hog<sup>w</sup>-os 'fear, flight' > \underline{p}hobos

*\underline{s}m-\underline{g}"elbhos 'brother' (< 'same womb') > \underline{a}del\underline{p}hos  *\underline{g}" > d

*\underline{g}when-\underline{i}-e/o- 'to smite, kill' > \underline{t}heine- *\underline{g}wh > \underline{t}h

*\underline{h}3e\underline{g}wh is 'snake' > \underline{o}phis *\underline{g}wh > \underline{p}h
```

5. In Attic Greek, $*\bar{a} > \bar{e} \ [\bar{\epsilon}]$, except after vowels and r.

```
*g*eh<sub>2</sub>-m 'I went' > (e)b\bar{e}n

*sueh<sub>2</sub>d-u-s 'sweet' > h\bar{e}dus

*seh<sub>2</sub>g-e/o- 'to seek' > h\bar{e}ge- 'to follow'
```

6a. Syllabic *n, *m become a

```
b^h n \hat{g}^h-ú-s 'thick, dense' > pak^h us (= Skt bahu- 'much, rich') de \hat{k} m 'ten' > de ka septm 'seven' > hepta
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6b. Syllabic * \mathfrak{r} , * \mathfrak{l} become ar/al or ra/la, depending on which made a better syllabification.

```
*i\bar{e}k^w r > h\bar{e}par 'liver'
                                                        *plth<sub>2</sub>-\acute{u}-s > platus 'flat'
    *uesr > ear 'spring'
    *mrg^h-u-s > brak^hus 'short'
6c. Tautosyllabic *Rh_1 > R\bar{e}/eRe, *Rh_2 > R\bar{a}/aRa, *Rh_3 > R\bar{o}/oRo
    (R = *m, *n, *l or *r)
   *ĝnh<sub>1</sub>-ti-s > genesis 'birth, origin'
                                                     *km-ti-\hat{g}_n h_1-tó-s > kasign\bar{e}tos 'brother'
                                                                 (< 'born together')
                                                      *k lh_1-tó-s > k l\bar{e}tos 'called'
                                                     *d^hnh<sub>2</sub>-tó-s > t^hnētos 'dead' (< t^hnātos)
   *g^{w}lh<sub>2</sub>-no-s > balanos 'acorn'
   *d^h n h_2-to-s > t^h anatos 'death'
                                                     *k_n h_2 m-eh_2 > kn\bar{e}m\bar{e} 'lower leg' (< kn\bar{a}m\bar{a})
   *\hat{k}_{r}h_{2} > kara 'head'
                                                     *knh_2\hat{k}-ós > kn\bar{e}kos 'honey-yellow'
                                                      *pi-prh<sub>2</sub>-sk-e/o- > pipr\bar{a}ske- 'to sell'
   *prh_2 > para 'beside'
   *plh_2m-eh_2 > palam\bar{e} 'palm'
   *mlh_2k-o-s > malakos 'weak'
   h_2nh_3-mn > onoma 'name'
                                                     *\hat{g}_n h_3-tó-s > gn\bar{o}tos 'recognized'
                                                     *strh_3-tó-s > strotos 'strewn'
                                                     *ti-trh<sub>3</sub>-sk-e/o- > titr\bar{o}ske- 'wound'
```

*mlh₃-sk̂-e/o- > $bl\bar{o}ske$ - 'to come'

6d. Heterosyllabic *R.H has the same outcome as *R

```
*g<sup>w</sup>r.h<sub>2</sub>-ú-s > barus 'heavy'

*pr.h<sub>2</sub>-os > paros 'before, earlier'

*gl.Hoù-os > galoōs 'husband's sister'

*sul.h<sub>2</sub>-eh<sub>2</sub> > aleā 'heat or warmth of the sun or of fire'
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7a. Initial *s before a sonorant continuant (*r or a vowel) becomes h, the 'rough breathing'.

```
*si-steh<sub>2</sub>-mi > hist\bar{e}mi 'I sit'
*sreg-i-e/o- 'to color' > r^hedze- 'to tint'
*sreu-e/o- 'to flow' > r^hee-
```

Sometimes initial *h*- before a vowel was lost in Attic-Ionic. This is known as *psilosis* ('becoming plain').

7b. Intervocalic *s first became *h and then was lost. The former presence of *h is sometimes shown by the failure of two adjacent vowels to coalesce, or in Mycenean by the absence of a glide j or w written between adjacent vowels.

```
*snusós 'daughter-in-law' > nuos

*nes-e/o- 'to return' > nee-

*h_2eus-\bar{o}s 'dawn' > \bar{e}\bar{o}s (< *ews\bar{o}s)
```

8. *u survives in Mycenean and some dialects and shows traces in Homer in metrical anomalies, but is lost everywhere in Attic and Ionic Greek. The former presence of *u is sometimes shown by the failure of two adjacent vowels to coalesce, especially in Homer.

```
*uh_2g-néu-mi 'I bite, split' > agn\bar{u}mi 'I break'

*h_2ueh_2-si '(the wind) blows' > a\bar{e}si

*h_2uerg-e/o- 'to turn' > eerge- 'to shut in or out, to hinder'

*uoik-o-s 'clan' > oikos 'house'
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8a. Initial *i has a complex set of outcomes, not all of which have been explained.

Normally initial *i becomes Greek zd.

```
*iug-ó-m 'yoke' > zdugón
*iese/o- 'to bubble, boil' > zdee- 'to boil, cook'
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A laryngeal plus *i can yield Greek h.

*Hiaĝ-i-e/o- 'to worship' > hazde-, cf. Skt yaj- $\tilde{n}a$ 'sacrifice'

9. 'Thorn' clusters are reversed:

```
*tetk-ōn 'carpenter' > t\acute{e}kt\bar{o}n

*tken-i-e/o- 'to injure' > kteine- 'to kill'

*h<sub>2</sub>(e)dhgh-e/o- 'to press' > akht^he- 'be burdened or oppressed'

cf. H hatki 'to shut, close'

*dh(e)ghom- 'earth' > kht^hon-, cf. H tekan
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10. A consonant + yod (*i) developed has various reflexes

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*pi > pt
                    *klep-i_e-e/o- 'to steal' > klepte-
*b^h i > pt
                    *d^hmbh-i-e/o- 'to bury' > t^hapte-
*ti > ss, tt
                    *melit-ih<sub>2</sub> 'honeybee' > melitta, melissa
                    *\hat{g}^hed-\hat{i}-e/o- 'to defecate' > k^hezde-
*di > zd
                    *dieú-s 'sky god' > zdeus 'Zeus'
*d^h i > s
                    *med<sup>h</sup>ios 'middle' > mesos
                    Pre-Greek *helik-ie- > helisse- 'to turn around'
*ki > ss, tt
                    Pre-Greek *hēk-ion- 'less' > h\bar{e}sson-, h\bar{e}tton-
                    *pek^{w}-<u>i</u>-e/o- > pesse-, pette- 'to cook'
*k^{w}i > ss, tt
                    *stig-i-e/o- 'to be sharp' > stizde- 'to prick, punction'
*gi > zd
*g^h i > ss, tt
                    *d^h r h_2 g^h - i - e/o - 'to stir up' > tarasse -, taratte -
Vri > Vir
                    *sker-i-e/o- 'to clip short' > skeire-
*Vni > *Vin
                    *ten-i-e/o- 'to stretch' > teine-
*Vli > *Vll
                    *stel-i-e/o- 'to send' > stelle-
```

11a. Clusters with *n and *s lose the *n when final but lengthen a preceding vowel

*Vns
$$> \bar{V}$$
s *-ons acc.pl. $> -\bar{o}s$

11b. *ti becomes si

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3pl thematic present *-onti > -\bar{q}si
*d<sup>h</sup>eh<sub>1</sub>-ti-s 'placing, putting' > t^h\bar{e}sis
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Note that Greek *ti* can come from *k^wi or from *t^hi deaspirated by Grassmann's Law

A substantial portion of the Greek vocabulary is not demonstrably Indo-European in origin. Some common words of this type include:

| <i>sop^hós</i> 'skilled, wise' sophistry | p ^h ásganon 'sword' |
|---|---|
| doũlos 'slave' DULOSIS | kéleuthos 'road, way, path' |
| $p^h r \acute{a} z d\bar{o}$ 'to point out, show, declare' | thálatta 'sea' THALASSO- |
| PHRASE | áηgelos 'messenger' ANGEL |
| (w)ánaks 'lord, master' | léon- 'lion' LION |
| ánthropos 'person' ANTHROPOLOGY | hósios 'honored as holy, sanctioned' |
| pémpō 'to send' POMP | $t^h a \tilde{u} m a$ 'wonder, marvel' THAUMAT-URGY |
| $bl\acute{e}p\bar{o}$ 'to see, look', $bl\acute{e}p^haron$ 'eyelid' | <i>t</i> ^h álamos 'inner room, chamber' THALAMUS |
| BLEPHARO-PLASTY | $k^h al \dot{a} \bar{o}$ 'to loosen' CHALAZA |
| eáō (< *sewáō) 'to let, allow' | heúdō 'to sleep' |
| paúō 'to stop' PAUSE | brétas 'wooden image of a god' |
| hellás 'Greece' HELLADIC | āer- 'air' aerial |
| héllen 'a Greek' Hellenic | kátharos 'clear of dirt, spotless' Catherine |
| $g\tilde{aia} = g\tilde{e}$ 'land, earth' GEO- | geítōn 'one of the same land, neighbor' |
| párthenos 'girl' Parthenon | GEITONO-GAMY |
| púlai 'gates' Thermo-pylae | askéō 'to work curiously, form by art' |
| dámar 'wife' | ASCETIC |
| pétra 'rock, boulder, cliff', pétros 'stone' | <i>líthos</i> 'stone' LITHO- |
| Peter, petro- | mákar 'blessed, happy' Macaronesia |
| aspís 'shield' ASPIDISTRA | bóstruk hos 'curl of hair' |
| $ksip^hos$ 'sword' xiphoid | deipnon 'dinner' |
| basileús 'king' Basil | prútanis 'prince, ruler' (Etruscan cognate) |
| $ark^h\bar{o}$ 'to be first, to rule', $\acute{a}rk^h\bar{e}$ 'begin- | túrannos 'tyrant' TYRANT |
| ning' ARCH- | ksánthos 'yellow' xantho- |
| <i>t</i> ^h eáomai 'to look at, gaze upon' THEATER | kalúptō 'to cover with' EU-CALYPTUS |
| est ^h lós 'good, noble' | eiréne 'peace' Irene |
| mélathron 'ceiling' | hámilla 'contest, conflict' |
| euné 'bed' eunuch | éŋkhos 'spear, lance' |
| ameinon- 'better, abler, stronger' | eskhára 'hearth, altar for burnt offerings' |
| háptomai 'to touch, take hold of' SYN-APT- | ESCHAR |
| IC | ók ^h t ^h os 'hill' |
| $sp^h \acute{a}zd\bar{o}$ 'to slaughter' | thrónos 'seat, chair' throne |
| pólemos 'war' polemic | drósos 'dew' drosophila |
| álgos 'pain, grief' AN-ALGESIC | sídēros 'iron' sidereal |
| $m\bar{e}k^han\acute{e}$ 'instrument, machine' | óknos 'shrinking, hesitation' |
| MECHANICAL | sálpiŋks 'trumpet' SALPINGOSTOMY |

 $ap\acute{e}n\ddot{e}$ 'four wheeled wagon' $r^h\bar{n}n$ - 'nose' rhino óstrakon 'potsherd, tile' ostracize énara 'arms of a slain foe, booty' $k\~{e}tos$ 'sea-monster, seal, whale' cetacean $gla\~{u}kos$ 'gleaming, silvery' GLAUCOMA $k^hla\~{u}na$ 'pallium (kind of garment)' $d\acute{a}p^hn\bar{e}$ 'laurel' Daphne $l\'{u}ra$ 'lyre' Lyre

dáktulos 'finger' PTERO-DACTYL

thēsaurós 'treasure' THESAURUS

súriŋks 'pipe' SYRINGE

ámpelos 'vine' AMPELOPSIS

hérōs 'warrior' HERO

kíthara 'harp, lute' CITHERN

kúliks 'drinking cup' (also appears in

Latin as CALYX)

lōtós 'lotus' LOTUS

Borrowings into Greek from Semitic languages or Egyptian

déltos 'writing tablet'

délta 'the name for a group of islands found at the mouth of large rivers such as the Nile (owing to their shape like Δ)' DELTA

kánt^haros 'dung beetle, Spanish fly, large scarab, worshipped in Egypt' CANTHARIDES *bússos* 'fine flax or linen' BYSSUS

krókos 'the purple CROCUS; saffron (made from the stamens of the purple crocus)' *iáspis* 'JASPER'

kassía 'CASSIA, an Arabian spice'

klōbós 'cage, bird cage'

kóttanon 'small fig'

kúmīnon 'cumin'

mánna 'morsel, grain, MANNA'

múrra 'MYRRH'

 $ot^h \acute{o} n\bar{e}$ 'fine white linen, linen sheet or cloth'

stúraks 'the shurb which yields a gum called STORAX'

sákkos, sákos 'coarse cloth of hair, esp. goat's hair; a bag made of this cloth'

básanos 'touchstone' (< Egyptian bahan 'stone')

kómmi 'GUM' (Egyptian kemai)

bais 'palm leaf' (Egyptian)

ébonos 'EBONY' (Egyptian)

 $el\acute{e}p^h\bar{a}s$ 'ivory; ELEPHANT' (Egyptian)

nítron 'carbonate of soda' (Egyptian) NITRATE

? $Ap^h rod \tilde{t} \bar{t} e$ 'Aphrodite'

? $akal\tilde{e}p^h\bar{e}$ 'a nettle, sting of a nettle'

? muríkē 'tamarisk' (cf. Latin tamariscus)

? kánnē, kánnā 'CANE, reed'

? kárabos 'the stag-beetle; a prickly kind of crab' CARABID

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? bīkos 'an earthen wine vessel' (? BEAKER)
? arrabōn 'earnest money, pledge'
? (s)máragdos 'a precious stone, green in color' (NHG SMARAGD 'emerald')
? kupárittos 'cypress' (later borrowed into Latin as cypressus)
? sákos 'shield'
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Other words probably borrowed from languages outside Greece:

kúanos 'enamel, lapis lazuli, blue copper carbonate: a dark blue substance used to adorn works in metal' (borrowing from an Anatolian language, cf. Hittite kuwanna- 'ornamental stone') CYAN kánnabis 'HEMP' (very early borrowing into PIE, becoming OE hænep, OHG hanaf) *arbúlē* 'a strong shoe or half-boot' (Iranian?) stleggis 'a sort of scraper used to dirt and oil from the skin in the bath', also appears in Latin as *strigil* karpós 'fruit', also appears in Latin in carpō, carpere 'to pluck' CARP, CARPET krínon 'white lily' CRINOID $aló\bar{e}$ 'ALOE' párdos 'LEOPARD' $p\acute{a}nt^h\bar{e}r$ 'PANTHER' písos 'PEA', also appearing in Latin as pisum $t^h \acute{u}rsos$ 'THYRSUS, a wand carried by followers of Bacchus' (< Anatolian? cf. Hier. Luwian *tuwarsa*- 'vine') Bákkhos 'BACCHUS' (prob. borrowed from Lydian) mágos 'MAGUS, Persian seer' (< Iranian) MAGIC *gōrutós* 'quiver or bow-case' (< Iranian) parádeisos 'park' (< Old Persian) PARADISE kíttos 'ivy' kamára 'anything with a vaulted or arched covering; a covered carriage' CAMERA kóphinos 'basket' coffin kárdamon 'CARDAMOM' $k\acute{a}lk^h\bar{e}$ 'murex or purple limpet, from which dye was obtained' káktos 'CACTUS' íon 'violet' arák hnēs 'spider' ARACHNID koríannon 'Coriander' kúbos 'CUBE, dice', later borrowed into Latin as cubus $r^h \acute{o} don$ 'rose' (< Iranian?) RHODO-DENDRON élegos 'song or melody accompanied by the flute' (? < Anatolian) ELEGY

Amadzốn 'Amazon' (? < Iranian)

 t^h iasos 'band or company marching through the streets with dance and song: the retinue of Bacchus' (? < Anatolian)

 $k\tilde{e}pos$ 'garden, orchard, plantation; the enclosure for the Olympic games' (? < a old European language)

ágnos 'the withy, a tall tree like the willow' (? < a old European language)

iksós 'mistletoe berry; birdlime prepared from mistletoe berries', also borr. into Latin as *uiscum* 'birdlime', and prob. in Russian as *víšnja* 'cherry' VISCOUS

- ? alkuốn 'kingfisher (bird)'
- ? grūpós 'curved, hooked, hook-nosed' GRYPHON
- ? ákherdos 'prickly pear'
- ? kótinos 'wild olive'
- ? $t^h \hat{o}s$ 'jackal'
- ? kúrbeis, kúrbies 'pillars or tablets with inscriptions'
- ? sibúnē, subúnēs 'hunting spear'
- ? $kr\bar{o}búlos$ 'a roll of hair gathered to a knot at the crown of the head; the crest of a helmet'
- ? antakaĩos 'a kind of sturgeon (fish)'