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LARYNGEAL BEFORE SONANT

BY

L. L. HAMMERICH



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To
HOLGER PEDERSEN
the octogenarian

§ 1. Introduction. The Laryngeal Phoneme *H*.

In his fine and broad survey of the lost consonantal elements of Indo-European, KURYŁOWICZ¹ has maintained that in most cases the prothetic vowels of Greek are reflections of IE laryngeal phonemes. The hypothesis has been accepted by some scholars and partly rejected by others.² I should think that in the main it is true, but would apply to the material a rather simple consideration which seems apt to corroborate older ideas and on some points to give further elucidation.

As will be observed, I mostly follow trends of thought developed by HOLGER PEDERSEN, though some explanations deviate from his views. Certainly he is not to blame for my shortcomings.

HANS HENDRIKSEN has shown that even if—as is generally assumed—Pre-Indo-European boasted more than one laryngeal sound, only one laryngeal phoneme survived in the Indo-European mother language. It is therefore our right and duty to investigate into the position and quality of the Indo-European laryngeal phoneme without taking any heed of possible former differences of quality. Until a phonetic explanation of the IE laryngeal sound is found, I shall use the non-committal symbol *H* proposed by HOLGER PEDERSEN.³

§ 2. Teutonic *h*.

It is generally agreed that the early IE languages, as we know them, do not display any laryngeal sounds.

In a sonant function the IE laryngeal phoneme is everywhere materialized as an ordinary vowel; in a consonantal function it has only been preserved in Hittite (and cognate "Anatolian" languages), not as a laryngeal, but as a velar spirant, originally voiced,

but voiceless in Hittite (*h*), whereas in the other IE languages the laryngeal consonant has mostly disappeared, thereby lengthening a preceding vowel.¹

In possessing laryngeal sounds Pre-Indo-European bore resemblance to the Semitic languages, and valuable information has sometimes been gained by comparing the few IE facts with the rich Semitic variety. On the other hand it is not perhaps unprofitable to take into consideration a group of IE languages which all possess one laryngeal phoneme, viz. the Teutonic languages. Even if the IE laryngeal sound was by no means identical with the voiceless *h* of Teutonic, the manifestations of the Teutonic laryngeal phoneme may nevertheless be illustrative.

As Teutonic *h* derives from IE *k*, the intermediate stage is [x], but in most positions this sound very early developed into the voiceless laryngeal spirant [h]. In early Teutonic we find the *h* (a) before a vowel; in this position it has been preserved till the present day in all Teutonic languages, (b) between vowels; here it is weak, apt to be voiced and to be lost, (c) before the sonants *w*, *r*, *l*, *n*: in this position there are interesting differences between the various Teutonic languages, and we shall have to go into some details. Old English has e. g. *hwilc* 'which', *hring* 'ring', *hliehhan* 'laugh', *hnutu* 'nut', and we find corresponding forms in the other early Teutonic languages: Gothic, Old Norse, Frisian, Old Saxon, and Old High German. This is not accidental. Old Teutonic possessed *hū-*, *hr-*, *hl-*, and *hn-*, because Pre-Teutonic Indo-European presented *kū-* (lat. *quis*), *kr-* (gr. κρικός), *kl-* (O.Ir. *cluiche* 'play'), and *kn-* (Gk κνύω 'scrape'). And Old Teutonic lacked the two other phonetically possible combinations of *h* with sonants, *hm-* and *hī-*, because Indo-European hardly knew the sound-combination *km-* (at the beginning of a word), and because *i* after initial velar has been ruled out in Primitive Teutonic or Pre-Teutonic times: Old Teutonic knows no words with *kī-* or *gī-*, any more than with *hī-*.

There is, in the development of the Teutonic languages, no opportunity for *hm-* to spring up. But in some Teutonic languages *hī-* arises through the "breaking" of a vowel after *h*, thus OI *hjer̥ta* 'heart', *h̥jqr̥tr* 'hart, stag', Mod. Fris. *h̥jouwer* 'oats', etc.

In the later development of the Teutonic languages, *h* is apt to

be lost before sonant. This has been the case in Swedish, Danish, (and Norwegian A: "Bokmål"), Frisian, Low German, Dutch, and High German, e. g. Germ. *welcher*, *ring*, *lachen*, *nuss*. In Swedish, Danish and Frisian *h* is still written before *j*, but it is not pronounced: Swed. *hjärta*, Dan. *hjerte* 'heart', Fris. *hjouwer* 'oats' have—in standard pronunciation—precisely the same [j] as Swed. *järn*, Dan. *jern* 'iron', Fris. *joun* 'evening'. In Danish and Frisian *h* is written, too, before *v/w*, but—in standard pronunciation—not spoken: Dan. *hvad*, Fris. *hwat*, 'what' have the same [v] as Dan. (Norw.) *vakker*, Fris. *wakker* 'fine'.

In English, which, in regard to consonants, is the most conservative West Teutonic language, *hw-* has survived, written *wh-* and in standard pronunciation having the phonetic value of a voiceless *w* [w̥], as the aspiration has pervaded the whole labial sound, e. g. *which* [wɪtʃ] as against *witch* [wɪtʃ]; but many English speaking people disregard this peculiarity and pronounce *which* exactly like *witch*.—In some parts of Jutland, especially West Jutland, *hv-* (e. g. in *hva* 'what', *hvem* 'who') is pronounced exactly like standard English *wh-* in *which*, *what*, thus differently from the [v] of common Danish *hv-* in *hvad*, *hvem*.

In the most archaic of existing Teutonic languages, in Modern Icelandic, the old combinations of *h* with sonant (*hw-*, *hr-*, *hl-*, *hn-*, *hi-*), have survived entirely: *hvílikur* 'which', *hringur* 'ring', *hlæja* 'laugh', *hnót* 'nut', *hjarta* 'heart'; and in *hr-*, *hl-* and *hn-* the *h* is really pronounced *h*, i. e. as a voiceless laryngeal spirant.

But *hv-* is pronounced [xw̥] or—especially in Northern Iceland—[kw̥], thus *hvílikur* as [xw̥i'liɡør] or [kw̥i'liɡør], a corresponding pronunciation being found in West Norwegian dialects and in Norwegian B ("Nynorsk"), e. g. *kva* 'what'. Finally, *hj-* is pronounced [ç], viz. as an unvoiced, emphatic, mostly aspirated palatal fricative: *hjarta* as [ça^drða]; a corresponding pronunciation of *hj-* is displayed by the dialects of Jutland in Denmark.

As *hj-* has arisen from *h* before a vowel, in Old Norse in the Viking Age, in Frisian much later, there is no doubt that the voiceless emphatic palatal fricative of Modern Icelandic (and Jutlandish) *hj-* [ç] is due to the combination of the laryngeal *h* with the palatal *i* and has nothing to do with the velar value [x], which for centuries earlier than the Viking Age had been characteristic of Teut. *h* before vowels.

Correspondingly it is probable that *hu-* had in Old Norse, just as e. g. in Old High German, an initial laryngeal spirant, and that the velar spirant ([xw̥iːliɡør]), which has eventually developed into a velar occlusive ([kw̥iːliɡør], Mod. Norw. *kva*), is no direct continuation of the Teutonic velar spirant.

If this is true, the Mod. Icel. pronunciation of *hj-* and *hv-* gives us instances of a laryngeal sound having developed into a velar or palatal consonant.

To sum up, then, we may say that the Teutonic laryngeal phoneme *h* is found in initial position before vowels and before the sonants *u*, *r*, *l*, and *n*, in some Teutonic languages through a peculiar development before *i*, too, but, for special reasons, not before *m*. In the position before sonants *h* is only maintained fully in Modern Icelandic, but has been lost, more or less, in the other Teutonic languages.

§ 3. *hu-* in Hittite and Greek.

Turning to the investigation of the laryngeal phoneme in the IE languages, we shall start with the statement that Hittite has *h*—deriving from IE *H*—before vowels, e. g. *ha-an-ti* / *hanti* / ‘in front of, before’, Gk *ἀντί*, Lat. *ante*, but also many words beginning with a pure vowel, e. g. *eš-zí* / *estsí* /, Gk *ἔστι*, Lat. *est*, and that there is no reason to deny that Hittite here in principle reflects the IE situation.

In the position before sonants we only find Hitt. *h* before *u*, e. g. *hu-wa-an-te-eš* / *hwanteres* / ‘winds’ cf. Lat. *ventus* < **huēhnt-*,¹ Gk *ἄησι* ‘blows’, Skr. *vāti*, Goth. *waian*: IE **huēh-*; *hu-iš-zí* / *hwistsi* / ‘lives’, Gk *νύκτα . . . ἄεσα* ‘stayed the night through’, Skr. *vāsati* ‘lives, dwells’, Goth. *wisan*: IE **huēs-*; *hu-it-ti-ia-zi* / *hwityatsi* / ‘draws, leads, strings a bow’, Gk *ἄεθλος* ‘fight, struggle’, *ἄεθλον* ‘prize-stake’, Goth. *wadi* ‘pledge’: IE **huēdh-*²; *hu-u-wa-ar-daḥ-ḥi* / *hwardaḥi* / ‘I curse’, with the zero-grade in /*hurtais*/ ‘curse’, Lat. *verbum*, Goth. *waurd*: IE **huērdh-*.

In the first three of these roots we find a Greek prothetic vowel at the place of the Hitt. *h*, evidently—as is now generally agreed—representing the IE laryngeal phoneme. In other cases, where there is no Hittite equivalent, we are therefore induced to interpret a Greek word with prothetic vowel before IE *u* as

indicating initial IE *hu*, e. g. αείρω 'raise, lift', ἄορτήρ 'strap, sword-belt', Lat. *verrūca*, Eng. *wart*, Skr. *varṣmān-* 'height, top': IE **Huer-*; perhaps εἶλλω 'I press', οὐλαμός 'multitude', Russ. *velik* 'great': IE **huel-*.

As, on the other hand, Hittite has also words of well-known IE origin beginning not with *hu-*, but with *u-* (e. g. *wa-a-tar* (gen. *ú-e-le-na-aš*) 'water'), we may safely infer that IE had some roots beginning with *u-* and others beginning with *hu-*.

§ 4. *hm-*, *hn-*, *hl-* in Greek and Armenian.

Before other initial sonants Hittite has no sure instances of *h* derived from IE *h*. It is, in itself, if not impossible, nevertheless improbable that Hittite should reflect here the IE configuration, since we know that Hittite in other positions undoubtedly has lost the representative of the IE laryngeal phoneme. It is much more likely that Hittite has lost *h* (or *h̄*) before the other sonants—just as English has preserved Teutonic *h* before *u*, but has lost *h* before the other sonants. This can probably be converted into a certainty, if Greek, which has a prothetic vowel as a representative of IE *h* before IE *u*, can be shown to have a similar prothetic vowel before the other sonants.

For practical reasons our investigations will follow the order: *m*, *n*, *l*, *r*, *i*.

Before *m* the sure instances are rare:

Gk ἀμέλω 'I milk', Lat. *mulgeō*, Germ. *melken*, etc.: IE **hmelǵ-*;
Gk ἀμέρω 'I wipe dry', Lat. *margō*, Goth. *marka*, etc.: IE **hmerǵ-*;
Gk ἀμάω 'I mow', OHG *māen*, Lat. *melō*: IE **hmen/hmet-*.¹

Before *n* we have more examples, and in some cases we here find support in Armenian, which sometimes has a prothetic vowel of the same character as the Greek one: ἀνήρ (acc. ἀνέρα, gen. ἀνδρός) 'man', Arm. *ayr* (gen. *ar'n*), Skr. *nár-*, Lat. *Nerō*: IE **hner-*; Gk ἐννέα 'nine', Arm. *inn*, Skr. *návan-*, Lat. *novem*, Goth. *niun*, etc.: IE **hneun̥-*; Gk ὄνομα 'name', Arm. *anun*, Hitt. *laman*, Lat. *nōmen*, Goth. *namo*, etc.: IE **hnomn-*; Gk ὄνειδος 'blame, shame', Arm. *anicanem* 'I curse', Skr. *nīndati* 'rebukes', Goth. *ganaitjan* 'revile': IE **hneid-*.

Without the assistance of Armenian we may cite such examples as Gk ἀνεψιός 'nephew', Skr. *nápāt-*, Lat. *nepōs*, etc.: IE **hner-ht-*;

Gk *ὀνίνημι* 'am useful to' (fut. *ὀνήσω*), *ὄνειαρ* (= *ὄνηαρ*) 'profit', Skr. *nāthā-* 'help, assistance': IE **hneh-*.

Neither do we lack examples before *l*, even if here there is little support from Armenian: Gk *ὀλίγος* 'little, small', Arm. *atk'at* 'poor', O.Ir. *líach* 'miserable': IE **hleik-* (the Greek word probably has -γ- from the stem of *λοιγός* 'ruin, destruction, misery'); Gk *ἄλωπιξ* 'fox', Arm. *alwēs*, Skr. *lopāśa-*, cp. Av. *raopi-š*: perhaps (the forms are not true parallels) IE **hlohpək-*, at any rate with *hl-*.

Further: Gk *ἐλαχύς* 'short', Skr. *raghú-* 'rapid', and Gk *ἐλαφρός* 'light', OHG *lungar*, cp. Goth. *leihts*: IE **h₁h₂g^uh-*; Gk *ἀλείτης* 'guilty', *ἄλοιπός* 'criminal', *ἄλιπρός* 'guilty', OI *leiðr* (Mod.Eng. *loth*, Germ. *leid*), Lith. *lieczyù* 'irritate': IE **hleit-*; Gk *ἐλεύθερος*, Lat. *liber*, Gk *ἐλεύσομαι* 'I shall come' (?), Skr. *ródhyate* 'thrives', Goth. *liudan* 'grows', O.Slav. *ljudjē* 'people', OHG *liut*: IE **hleudh-*; Gk *ἐλινύω* 'I rest, delay, linger', Goth. *aflinnan* 'go away', OI *linna* 'give way', *linnr* 'soft', etc.: IE **h₁li-n₂-* (perhaps **hle₁-* in Skr. *iláyati* 'stands still, comes to rest' (?)); Gk *ἐλελίζω* 'I shake' (< **hle(u)liqion*), Skr. *réjati* id., Goth. *laikan* 'jump', Lith. *láigyti* 'run disorderly': IE **hleig-*; Gk *ἔλεος* 'pity, mercy', perhaps Goth. *lewjan* 'betray', Lith. *liáutis* 'cease', Lett. *l'aut* 'permit' (the semantic development would be 'yield', 'leave', 'betray'): IE **hle₂-*: *hle₂-*; Gk *ἄλεισον* 'wine-cup', OHG *lid* 'cup, fruit-wine', Goth. *leiþu* acc. sg., 'fruit-wine', O.Ir. *lith* 'festival': IE **hleit-*.

Besides these words with IE *hm-*, *hn-*, *hl-* we may cite many instances where Greek has initial *m-*, *n-*, *l-* in correspondence with what is found in the other IE languages, e. g. *μέγας* 'great' (Skr. *máhi*, Arm. *mec*, Lat. *magnus*, Goth. *mikils*, etc.), *μέμονα* 'I bear in mind' (Lat. *memini*, Goth. *gaman*, Skr. *mányate* 'thinks', O.Slav. *pa-męti* 'remembrance'), *μήτηρ* (Skr. *mālár-*, Arm. *mayr*, O.Slav. *mati*, Lat. *māter*, O.Ir. *máthir*, OS *môdar*), *μισθός* 'salary' (Skr. *mīdhá-*, Avest. *mižda-*, O.Slav. *mīzda*, Goth. *mizdo*), *μῦς* (Skr. *múṣ-*, Arm. *mukn*, Lat. *mūs*, OHG *mūs*); *νέφος* 'cloud', *νεφέλη* 'mist' (Skr. *nábhaḥ*, O.Slav. *nebo* ('sky'), Lat. *nebula*, O.Ir. *nél*, OHG *nebul*), *νέος* 'new' (Skr. *náva-*, Arm. *nor*, Lat. *novus*, O.Ir. *núe*, Goth. *niujis*), *νύξ* 'night' (Skr. *nák(ta-)* Alb. *natë*, Lat. *nox*, O.Ir. *-nocht*, Goth. *nahts*), *νῆς* 'ship' (Skr. *naú-*, Lat. *nāvis*, O.Ir. *nau*, OI *nór*), *νη-* 'un-' (Skr. *nā*, Lat. *nē·quidem*, O.Ir. *ní*, Goth. *ne*); *λείπω* 'I let, quit' (Skr. *riṇákti*, Arm. *lk'anem*, Lith. *liekù*, Lat.

linquō, Goth. *leihwan*), λευκός 'brilliant, light' (Skr. *rócate*, Arm. *loys*, O.Slav. *lučī*, Lat. *lūceō*, Goth. *liuhaf*), λέχος 'bed' (O.Slav. *lože*, Lat. *lectus*, O.Ir. *lige*, Goth. *ligrs*), λύω 'I loose' (Skr. *luṅáti*, Lat. *luō*, Goth. *laus*).

§ 5. Greek *hm-*/*m-*, *hn-*/*n-*, *hl-*/*l-*.

We have furthermore to take into consideration the fact that in Greek we sometimes have words with μ -, ν -, λ -, which in primitive Greek must have had *hμ*-, *hν*-, *hl*-, originating in $\sigma\mu$ -, $\sigma\nu$ -, $\sigma\lambda$ -, since in many cases *s*- has developed into *h*- (just as *i*- and—somewhat later—*u*-), cp. *ἄλς*, Lat. *sal*, *ἴημι*, Lat. *jaciō*, *ἔσπερος*, Lat. *vesper*).

This is perfectly clear with ν -: *νήχω* 'I swim' and *νάει* 'streams' (Skr. *snáti*), *νή* 'spins' (M.Ir. *sníid*), *νείφει* 'it snows' (Av. *snaēzāt* 'it is going to snow', Ir. *-snigid* 'it rains', OE *sníwid* 'it snows'), *νεῦρον* 'sinew' (Skr. *snávan-*, OHG *snuor*), *νύος* 'daughter-in-law' (Skr. *snusá*, OHG *snur*). There are no cases of $\sigma\nu$ -, IE *sn*- having in Greek always developed into *hν*- and then finally ν - (cp. the same development in Latin: *natō*, *neō*, *nīvit*, *nervus*, *nurus*).

This goes to show that primitive Greek must have had the triplicity *hν*-, ν -, and *hν*-, which triplicity, as ν - and *hν*- fused into ν -, was reduced to the duplicity *hν*- (represented by a prothetic vowel before ν -) and ν -: against *ἀνήρ* with IE *hn*-, we find *νη*- and *νή* with IE *n*- and *sn*-.

With μ - we sometimes have preservation of *sm*-: *σύχω* 'burn by a slow fire'—OE *sméocan* 'smoke', *σμερδνός*, *σμερδαλέος* 'terrible'—OE *smeortan* 'smart', *σμίλη* 'cutting-knife'—OI *smíðr* 'smith'; sometimes we have both $\sigma\mu$ - and μ -: *σμικρός* and *μικρός*, *σμίρις* 'emery', *μύρον* 'ointment'—OI *smjor* 'butter'.—This may now and then be due to the Indo-European instability of initial *s*- before consonants, but there are indubitable cases of *hμ*- as an intermediate stage between *sm*- and μ -, e. g. *μία* < **hmia* < **smiḡ* as the feminine of *ἔϊς* < **sems*. In primitive Greek then, we have had—even if perhaps rarely—the triplicity *hμ*-, μ - and *hμ*-, which, through fusion of μ and *hμ*- into μ -, has developed into the duplicity *hμ*- (represented by a prothetic vowel before μ -) and μ -: against *ἄμάω* with IE *hm*-, we find *μισθός* and *μία* with IE *m*- and *sm*-.

There is a possibility that the scarcity of Greek words with a prothetic vowel before μ -, originating in IE hm -, may be due to this combination being really rare in Indo-European.

With λ - it is mostly as with ν -: Greek lacks $\sigma\lambda$ - (just as it lacks $\sigma\nu$ -), and λ - therefore sometimes represents sl -. The examples are rarer than with ν -, but we cannot very well doubt such cases as: $\lambda\acute{\upsilon}\gamma\chi$ 'hiccup', $\lambda\acute{\upsilon}\zeta\omega$ 'I hiccup'—MHG *slucken* (Germ. *schlucken*, *schluckauf*), O.Ir. *slucim* (here there is a difference in the velar); $\lambda\acute{\eta}\gamma\omega$ 'I cease, desist from', $\acute{\alpha}\lambda\lambda\eta\kappa\tau\omicron\varsigma$ 'unending' ($-\lambda\lambda-$ < $-\sigma\lambda-$), $\lambda\alpha\gamma\alpha\rho\acute{\omicron}\varsigma$ 'slender, slack', $\lambda\omega\gamma\acute{\alpha}\nu\omicron\iota\omicron\nu$ 'dewlap', OE *slæc*, OI *slakr* 'slack', OI *slókr* 'weakling'. Thus, here, too, primitive Greek had the triplicity hl -, λ -, $h\lambda$ -, being reduced—through fusion of λ - and $h\lambda$ - into λ —to the duplicity hl - (represented by a prothetic vowel before λ -) and λ -; against $\acute{\omicron}\lambda\acute{\iota}\gamma\omicron\varsigma$ with IE hl -, we find $\lambda\acute{\epsilon}\acute{\iota}\pi\omega$ and $\lambda\acute{\upsilon}\gamma\chi$ with IE l - and sl -.

But the development has not been so regular as with n -. There is a remarkably great number of cases of prothetic vowel before λ - deriving from hl -; it might sometimes be suspected that words with IE l - may have got hl - in primitive Greek. Especially so, because there are cases of a prothetic vowel before λ -, where we do not expect it. With full consideration of the uncertainties connected with semi-onomatopoeical words, it is scarcely possible to separate the roots of $\acute{\omicron}\lambda\iota\sigma\theta\acute{\alpha}\nu\omega$ ($\acute{\omicron}\lambda\iota\beta\rho\acute{\alpha}\zeta\omega$, gramm.) 'I make a slip', $\acute{\omicron}\lambda\iota\sigma\theta\eta\rho\acute{\omicron}\varsigma$ ($\acute{\omicron}\lambda\iota\beta\rho\acute{\omicron}\varsigma$, gramm.) 'slippery' from (1) the Teutonic, Celtic, and Balto-Slavonic words with $*sle\acute{i}dh/*sle\acute{i}b$: OE *slidan* 'to slide', OE *slidor* 'slippery', M.Ir. *slóet* 'slide (on the ice)', Lith. *slidùs* 'slippery', O.Slav. *slèdŭ* 'trail'—OE *slipor*, OI *sleipr* 'slippery', OHG *slifan* 'slide'; and (2) Greek words such as $\lambda\epsilon\acute{\iota}\omicron\varsigma$ 'smooth', $\lambda\epsilon\acute{\iota}\mu\alpha\chi$ 'slug' (Russ. *slimak*). Nevertheless we should not conclude that $sl > h\lambda$ - might become prothetic vowel + λ -; the development is different: in the primitive Greek period, when hl - developed into prothetic vowel + λ -, and $h\lambda$ - and λ - fused into λ -, it may have happened that sometimes an initial λ - (whether IE l - or sl -) got mixed up with hl - and so developed into prothetic vowel + λ -. I should think this the most simple explanation of $\acute{\omicron}\lambda\iota\sigma\theta\acute{\alpha}\nu\omega$, etc.

But then this should be considered a warning. We should not be too sure that the above-named cases in which Greek has a prothetic vowel + λ - and other IE languages simply l -

and in which Armenian affords no support (ἐλαχύς, ἀλείπτῃς, etc.) are always proofs of IE *hl-*; sometimes the *hl-* developing into prothetic vowel + *λ-* may have sprung up only in primitive Greek. This will appear clearly when we consider the state of things with *r-*.

§ 6. Greek *hr-* / *hr-*.

With *r* we have a new configuration, as no Greek words begin with a pure *ρ*, initial *ρ* having always the spiritus asper, whereas many words which in the other Indo-European languages have initial *r*, in Greek have a prothetic vowel + *ρ*.

To understand this, we must start from the assumption that primitive Greek had the same triplicity of initial *r*, as with initial *m*, *n*, *l*, viz. *hr-*, *r-*, and *hr-*. But whereas *m-* and *hm-*, *n-* and *hn-*, *l-* and *hl-* fused into *μ-*, *ν-*, *λ-*, and whereas *hm-*, *hn-*, and *hl-* were preserved as prothetic vowel + *μ/v/λ*, with *r* things are different: here *hr-* is preserved as *ρ-*, but *hr-* and *r-* fused into *hr-*, which is materialized as prothetic vowel + *ρ*.

The discrimination of *r-* is due to the fact that there was in primitive Greek more words with *hr-* than with *hm-*, *hn-*, and *hl-*, respectively: probably already in Indo-European more roots had *sr-* than *sm-*, *sn-*, *sl-*; but to the cases of prim. Greek *hr-*, developing out of IE *sr-*, not a few words were added with *hr-* originating in *ur-*. So besides words with IE *sr-*, such as e. g. the widely diffused root of *ῥεῖ* 'flows' (Skr. *srávati*, etc. cp. *ῥεῦμα*, *ῥοῦς*, *ῥυθμός*, etc.), *ῥίγος* 'cold, freezing' (Lat. *frīgus*), *ῥόθος* 'roaring of the waves' (OHG *stredan*), *ῥοφεῖν* 'absorb' (Lat. *sorbeō*, Arm. *arbi*), *ῥέγκω* 'I snore' (O.Ir. *srennim* 'sterto'), we find words with *ur-*, e. g. *ῥάδαμνος* 'root' (Goth. *waúrts*), *ῥάπτω* 'I stitch together' (Lith. *verpiù* 'spin'), *ῥήγνυμι* 'I break' (Dutch *wrak*, Arm. *ergic-uçanem* 'I break')¹ and the loan-word *ῥόδον* 'rose' (cp. Pers. *gul* < **ur̥dho-*, OE *word* 'thorn-bush').

There have been so many of these words with *hr-* in primitive Greek that it was necessary for the words with *r-* to keep clear of them. And so, as it evidently was too cumbersome to keep up the triplicity *hr-/r-/hr-*, there was no choice for the words with *r-*: they had to fuse with the words with *hr-* into this sound, which developed into prothetic vowel (mostly *ε-*) + *ρ*.

In this way Greek has got words like *ἔρεῦθω* 'make red',

ἐρουρός, etc. (Skr. *róhita-*, Lat. *ruber*, OI *rjódr*); ἐρέφω 'cover with a roof', ὄροφος 'thatch' (OHG *hirni-reba* 'skull'); ἐρέχθω 'rend, break' (Skr. *rákṣas-*); ἐρείπω 'upset', ἐρίπνη 'precipice' (Lat. *rīpa*); ὀρύσσω 'dig' (Ir. *rucht* 'swine', IE **Hreuk-*?); ὀρέγω 'stretch', ὀργυια 'fathom' (Lat. *regō*, IE **Hreg-*?).

In most cases such words will have IE *r-*, but sometimes—as indicated—we may have a suspicion of IE *hr-*, and if Armenian gives support, we may be fairly sure of it, thus with ἔρεβος 'under-world', Arm. *erek* 'evening', Skr. *rájas-* 'darkness' (IE **Hreg^h-*), ἐρεύγομαι 'vomit', Arm. *orcām*, id., Lat. *ructō*, *ē-rūgō* (IE **Hreug-*).²

On the other hand, the transition of *r-* to *hr-* was no sound law; there was a choice between the two possibilities: *hr-* and *hr-*. And even if most words with IE *r-* for the above-named reason did choose *hr-*, we cannot find it strange, if some few words took a different course and preferred *hr-*. Indeed, we might justly be astonished, if this was not so. And really, we find words, with Greek ῥ- corresponding to IE *r-*, thus ῥέζω (Skr. *rájyati* 'is coloured'); ῥυκάνη 'plane of a joiner' (Lat. *runcō* 'weeding-hook', Skr. *lúnācali* 'pulls out').

§ 7. *Hī-* > Greek *z-*.

Arriving at the last of the IE sonants *ī*, we encounter the opposite difficulty to that perceived in the examination of *r-*; if with *r-* we had too many prothetic vowels in Greek to be able to select with security the cases of an initial laryngeal before *r-*, we find with roots beginning with *ī* no prothetic vowels at all, thus not the same indication of an initial laryngeal phoneme as before the other sonants. We keep in mind that the Teutonic languages had primitively the combinations *hu-*, *hr-*, *hl-*, and *hn-*, whereas *hī-* sprang up later and only in some Teutonic languages. And we might conclude that it is no wonder, if Indo-European, too, presents a laryngeal phoneme before all existing sonants with the exception of *ī*. But, on the other hand, there were very special reasons why Teutonic had no *hī-*, and as for Indo-European no reasons of the absence of *Hī-* are obvious. Perhaps the explanation is to be found in quite another way: if Greek before *ī* has no prothetic vowel as a

representative of IE *h*, the reason might be that Greek displayed another reaction to the laryngeal phoneme before *i* than in the other cases considered. We must therefore face the well-known facts of the Greek treatment of IE *i*.

Indo-European *i* in original position has in Greek only been preserved after a vowel, if no vowel follows, viz. as the *i* of the diphthongs αι, ει, οι, ρ, η, ω. The ordinary Greek rendering of IE initial *i* is *h* (spiritus asper), as in ἄγος 'veneration, sacrifice', Skr. *yajáh* 'veneration'; ἄπτω 'I touch', Skr. *yábhati* 'fuit' (?); ὑσμίνη 'turmoil of battle', Skr. *yúdh-* 'strife'; ἥπαρ 'liver', Lat. *jecur*; ἥμερος 'mild, tame', Skr. *yámati* 'holds together, subdues'; ἥβη 'vigour of youth', Lith. *jėgiù* 'am strong'. Thus at the beginning of the word the *i*- undergoes a development similar to that of *s*- and *u*-. Hence it is here impossible to state the primitive Greek triplicity of initial *i* ((1) with *h*, (2) without a laryngeal sound, (3) with *h*-), which we found in the cases of *μ*, *ν*, *λ*, *ρ*; since *i*- itself becomes *h*, it cannot be affected by this sound.—The same argument naturally applies to *u*, and therefore no consideration of triplicity was made concerning *u*-.

Between vowels *-i-* is lost (as *-h-* in Teutonic): τρεῖς < *τρες < *treies, and it is more or less reduced or displaced after *ϕ*, *ρ*, *λ*, *μ*, *ν*, *σ*: κλαίω < *κλαφιω, μοῖρα < *μορια, στέλλω < *στελιω, βαίνω < *βανιω (< *βαμιω < *g^uhⁱion*), κρίνω < *κρινιω, τοῦ/τοῖο < *τοσιο.

After occlusives we have very interesting developments: δι (< *di*, *g^ui* and *gi*) becomes ζ: Ζεύς < *diēus; ζῆ 'lives' < *g^uiēi; ὄζω < *ōdⁱω (cp. Lat. *odor*); νίζω 'wash' (-*g^ui-*, cp. Skr. *néjana-*), στίζω 'sting' (-*gi-*, cp. Lat. *instigāre*). But τι (< *ti*, *dhi* (> Gk θι), *g^uhi* (> Gk θι), *k^ui* (> Gk τι), and *ki*) becomes σ (σσ): σέβομαι 'am shy of' (Skr. *tyájati* 'leaves'); πέσσω 'mellow, cook' (-*k^ui-*: Skr. *pácati*, Lat. *coquō*); σεύω 'chase' (*ki-*: Skr. *cyávate* 'moves'); μάσσων comp. of μακρός 'big' (-*ki-*); μέσσοσ = Skr. *mádhya-* = Lat. *medius* (-*dhi-*), ἐλάσσων, comp. of ἐλαχύς, ἐλαφρός, 'light, rapid' (-*g^uhi-*); πάσσων, comp. of παχύς 'fat' (-*ghi-*). Finally πι (< *pi*, and *bhi* > Gk φι) becomes πτ: κλέπτω 'steal' (-*pi-*: Goth. *hlifan*), ἄπτω (-*bhi-*: Skr. *yábhati* (?)); both verbs have in Greek *i*- of the present. There are hardly sure examples with βι.

We may understand these developments when keeping in mind that Greek has no palatal consonants and only the den-

tals τ, δ, θ, σ, ζ; it has no voiced aspirated dental occlusive [dʰ], nor a voiced dental sibilant [z], nor an unvoiced dental affricate [ts]. We should find it most natural if *dī* developed into a voiced palatal affricate [dʒ], and it certainly has done so; but as this sound does not exist in Greek, the only outcome is the voiced dental affricate ζ. It would have been natural for *tī* to develop into an unvoiced palatal affricate or sibilant: but in the absence of these sounds, the result is the unvoiced dental sibilant σ (σσ). For *pī* something like *pts* would have been an easily comprehended halfway-position; but there being no unvoiced dental affricate, a remedy is sought in the dental tenuis, and the result is πτ.

It is remarkable that the aspirated groups θ₁ (χ₁), and φ₁ are developing quite like the non-aspirated groups τ₁ (κ₁) and π₁: the aspiration has no effect whatever. The evident reason is that *i* is unable to accept aspiration. What was said (p. 13 above) of the impossibility of opposing, in Greek, *h* and what has developed from IE *i*, can now be elaborated: there was in primitive Greek no phonemic difference between *i* and *hi* (cp. the same situation in Swedish, Danish, and Frisian, p. 5).

On this background we shall now have to consider the well-known fact that—as against the ordinary development: IE *i* > Gk *h*- (p. 13)—in some cases the *i*- of the other IE languages is rendered in Greek by ζ-: ζειά ‘spelt’, Skr. *yáva*-; ζεύγνυμι ‘couple, combine’, Skr. *yunájmi*; ζυγόν ‘yoke’, Hitt. *yukan*, Skr. *yugám*, Lat. *jugum*, etc.: ζέω ‘seethe’, Skr. *yásyati*, OHG *jesan* ‘yeast’; ζώνη ‘belt’, ζωστός ‘girdled’, Lith. *jūostas*; ζύμη ‘leaven’, Skr. *yūśán*- ‘juice’, Lat. *jūs*.

It is clear that the roots displaying in Greek ζ-, must in Indo-European have had an element before the *i*-. In comparing what we have seen in the examination of the other IE sonants, it stands to reason that we have here to do with IE *hi*-.¹

As shown above, the combination *hi* in most Teutonic languages fuses with *i* into this sound, but Modern Icelandic preserves the distinction between *i* and *hi*, and the latter is realised as one emphatic palatal sound [ç], whereas the other Modern Icelandic combinations of *h* and sonant remained two distinct sounds. In the same way, then, *hi*- in most IE languages fuses with *i*- into this sound, but Greek preserves a distinction between

i- and *hi*-. This latter sound-combination must have resulted in an emphatic palatal sound, the palatal voiced sibilant [ʒ] as in French *Georges*, or the palatal voiced affricate [dʒ] as in Eng. *George*. Proto-Greek obviously had the latter sound, which developed into ζ in the same manner as the [dʒ] < δ₁, mentioned above.

The fact that Greek has no prothetic vowel (originating in an IE laryngeal sound) before IE *i*, is not accounted for through absence of the IE combination *hi*-, but is based on a special phonetic development of this combination (resulting in an emphatic palatal sound, in Greek becoming ζ). This development must have taken place in Pre-Greek times, so that conditions for Greek altering the IE laryngeal into a prothetic vowel did not exist in the case of IE *hi*.

Thus it seems possible to state that Indo-European knew the laryngeal phoneme *h* before all sonants: *hi*-, *hi*u-, *hi*r-, *hi*l-, *hi*m-, *hi*n-.

At the same time we may discard the special (otherwise unknown) IE *j*-sound, which has been adduced as an explanation of the cases in which Greek has ζ- as against *i*- of the other IE languages: here there is no unknown phoneme, but a combination of the known phonemes *h* and *i*.²

§ 8. -*hi*- after Velar (Greek χϑ, φϑ, κτ).

The hypothesis that IE *hi*- developed into Greek ζ- is based on the assumption that the sound in question was different from *i* before the special developments of *h* and *i* in Greek began. It would therefore be very desirable, if we could derive support from some other IE language than Greek.

At the beginning of the word this is impossible, since in this position evidently *i* and *hi* have been mixed up in all IE languages with the exception of Greek.

In the middle (or at the end) of the word it is not easy to find conclusive material.

After a vowel we have *hi* in the "long" diphthongs *āi* < *ahi*, *ēi* < *ehi*, *ōi* < *ohi*, just as we have *āu* < *ahu*, *ēu* < *ehu*, *ōu* < *ohu*; but this is not very helpful, since phonetic conditions are here quite different: *h* evidently combines with the preceding vowel without exerting any influence upon the following sonant in

contradistinction to the case of initial $hi-$. If in an IE language vowels are found always to be long before some i -suffixes, not before other i -suffixes, this might be due to the first series of i -suffixes having IE $-hi-$, the other $-i-$. I shall not here try a verification of this possibility, since even in this case the phonetic conditions are the same as with the "long" diphthongs, different from initial $hi-$; the investigations for that matter would have to be extended to suffixes beginning with u .

After a consonant the laryngeal phoneme in most cases either disappears without leaving a trace, or is vocalized—and then again the phonetic circumstances are not comparable with those of initial $hi-$.

But there are exceptions, where the laryngeal seems to have preserved the consonantal value after a consonant and, if this consonant is an occlusive, has exercised a certain influence upon it. SAUSSURE and KURYŁOWICZ have pointed out that sometimes the Aryan aspirated tenues are due to a combination of IE tenues with the laryngeal phoneme.¹ And a special influence of h upon a preceding g is seen in the well-known cases of h in Skr. *duhitár-*, *máhi/mahát-*, *ahám* as against the g of the non-Aryan languages (cp. Gk $\Delta\upsilon\gamma\acute{\alpha}\tau\tau\eta\rho$, $\mu\acute{\epsilon}\gamma\alpha\varsigma$, $\acute{\epsilon}\gamma\acute{\omega}$, etc.). The Aryan (g) h has developed out of g , if this was secondarily followed by h .

The secondary character is obvious in all three words.

The Indo-European word for 'daughter' displayed a vacillation between consonantal and vocalic laryngeal (**dhug_hter-*: Goth. *dauhtar*, Lith. *duktė* — **dhug_hter-*: Gk $\Delta\upsilon\gamma\acute{\alpha}\tau\tau\eta\rho$, Toch. *tkācar* (length of *a* is secondary)). In Aryan the two possibilities have combined into **dhug_hter-* > Ar. **dhughitar-* > Skr. *duhitár-*; Gāthīc Avestan *dug_hdar* is certainly not directly identical with IE **dhug_hter-* (which here, too, must have become **dhuktar*), but a compromise between this form and Ar. **dhughitar-*, viz. **dhughtar* > **dhughdhar* > *dug(ə)dar*.²

To the IE stem **meǵ_h* (Gk $\mu\acute{\epsilon}\gamma\alpha$) Aryan adds the suffix *-nt/-ont*; the resulting **maǵ_hnt/*maǵ_hant* becomes Skr. *mahát-/mahánt-* (Av. *mazant-*)—and then the *-h-* is carried through in all forms (e. g. *máhi*).

The Indo-European personal pronoun of the 1. sg. has in most Indo-European languages the form **eǵ_h/*eǵ_{oh}*; in the zero grade there is perhaps vacillation between consonantal and vo-

calic laryngeal: **egh* in Hitt. *u-uk* (*u* is secondary; but it is also possible that a vowel has been lost at the end of the enclitic word, as in Hitt. *it* = Gk *ἴσι*, Skr. *ihī*), Arm. *es* (< **ec*); **eġh* in Teutonic (OI *ek*, Goth. *ik*; the preservation of the occlusive proves that a vowel has been lost at the end of the word), O.Slav. *jazŭ/azŭ*, perhaps in Lith. *eš/àš*, too;—**eġoh* in Gk *ἐγώ*, Lat. *egō*. In Aryan the personal pronouns take a suffix which is, in the singular and the plural, *-am* (*tvám*, *vayám*, *gūyám*); and so **aġh-am* becomes Skr. *ahám* (Av. *ažəm*, O.Pers. *adam*).

Since we have thus a special influence of the laryngeal phoneme upon a preceding velar consonant, we might venture to look out for traces of *hī* after velar consonants. And then it is impossible not to stumble upon the puzzling sound-combinations found in Greek as *χθ*, *φθ*, and *κτ*, in Sanskrit as *kṣ*, and in the other IE languages as a variety of different palatal, dental, or velar sounds.

I think that these can be reduced to the following IE groups: **ghī* (*ġhī*), **g^uhī*, and **khī* (*ḱhī*), where the laryngeal sound has emphasized the following *i* and has aspirated the preceding voiced *g/ġ* and *g^u*, but not *k/ḱ*; sometimes the rather cumbersome sound-combinations have been reduced in different ways. We shall have to examine the main facts in the various IE languages.

§ 9. Special Treatment. I. Greek.

As we can only be sure of these sound-combinations if we find the words in Greek, we begin with a list of the Greek words in question, giving only one form of each word and adding possible IE forms of the roots or stems:

χθών (**ġhīōm* : *ġhīem* : *ġhīm̄* / *ġhīm* (*ġhoim* / *ġhioim*; *ġhom?* *ġhem* : *ġhm* / *ġ(h)m-*); *χθές* (**ġhīes* (*ġhies*; *ġhes*); *ἐρέχθω* (**reġhīo-* / *reġhīo-*); *ἰχθῦς* (**ġhīu(s)*). Where *i* is preserved, *g* in the Satəm-languages is palatal *ġ*.

φθείρω (**g^uhīer* : *g^uhīor* : *g^uhīr*); *φθόνος* (**g^uhīen* : *g^uhīon* : *g^uhīr* (*g^uhen* : *g^uhon* : *g^uhn-*); *φθίνω* (**g^uhīei* : *g^uhīoi* : *g^uhīi*).

κτείνω (**khīen* : *khīon* : *khīr*); *κτάομαι* (**khīa(i)*); *κτίζω* (**ḱhīei* : *ḱhīoi* : *ḱhīi*); *ἰκτίνος* (**ḱhīin* (**ḱhīin*)); *τέκτων* (**teḱhīōn*); *ἄρκτος* (**ḡḱhīo-*).

A. Greek.

χθών 'earth, soil', χθόνιος 'earthly', χθαμαλός 'humble', cp. χαμαί 'on the earth', χαμηλός = χθαμαλός; χθές (and ἐχθές) 'yesterday'; χθεσινός = χθιζός 'belonging to yesterday'; ἐρέχθω 'break'; ἰχθύς 'fish'; — φθείρω 'spoil, annihilate', φθορά 'annihilation', φθείρ 'louse' (?); φθόνος 'envy' (cp.? θείνω 'beat, slay', φόνος 'murder', ἀρρίφατος 'killed in war'); φθίνω 'dwindle, make dwindle, annihilate', φθίσις 'exhaustion', φθή id.; (as regards φθόγγος 'tone', φθάνω 'come first', ἴφθιμος 'strong' no plausible etymologies seem available); — κτείνω 'kill', πατροκτόνος 'parricide', ἀνδροκτασίη 'manslaughter' (cp. (κατα)καίνω = κατακτείνω); κτάομαι 'acquire' (κέκτημαι 'possess'), κτέαρ 'possession' (< *κτααρ); κτίζω 'found, establish, settle', κτίσις 'colony', κτοίνα (Rhodos) 'dwelling place, district' (here κτίλος 'mild, tame'?), ἰκτίνας 'kite, milvus regalis'; τέκτων 'carpenter'; ἄρκτος 'bear'.—The etymologies proposed for such words as κτέρεα 'funeral gifts', κτύπος 'resounding' are hardly quite convincing. The words for 'eye(s)', such as ὄσσε, ὄφθαλμός (Boeot. ὄκταλλος), εἰς ὄππα—with correspondencies like Skr. *ákṣi-*, *akṣnáḥ*, Av. *ašī-*, Arm. *ačk'*, O.Slav. *oči/oko*, Alb. *sū*, Lat. *oculus*, OHG *awi-zoraht* 'manifest', Goth. *augo*, display an early and intricate mixture of different stems, so that they are not here fully taken into account.

In the assumed IE sound-combination **ghī* the effect of the laryngeal sound is to aspirate *g* and to emphasize *i* (the latter in the same manner as with Gk ζ < *dž* < *hi*, p. 15), thus—taking Bartholomae's law into consideration—the first result in Proto-Greek is **ghdhž*. Through the Greek unvoicing of the aspirated mediae and the Greek replacing of palatals by dentals (cp. *dž* > *dz* = ζ) the next stage of development is **khths*. But because in Greek no unvoiced dental affricate exists (p. 14 above), there is no other outcome than *khth* = χθ.

The same deliberations are valid as regards **g^hhī*, with the difference, naturally, that the labiovelar sound is changed into a labial one, thus < **bhdhž* > **phths* > *phth* = φθ.¹

With regard to **khi*, this combination must in Pre-Greek give **klš* and, through a development parallel to those just described and to that of *pi* > πτ (p. 14 above), result in κτ. It is remarkable that *h* has no palpable effect upon the *k*: this is in

accordance with the fact that outside Indo-Iranian *h* is not known to aspirate a preceding *k*.

Under unknown conditions the laryngealization now and then has pervaded the sound-combination so thoroughly that even a prothetic vowel springs into existence: ἐχθές besides χθές, ἰχθῦς, ἰκτίνος (before *i* or *u* in the neighbouring syllable the prothetic vowel is apt to be *i*; cp. ἴκτις—(ἰ)κτίδος ‘weasel(-)’, ἴκρια ‘half-deck, platform’, ἰλύς ‘mud’ (? < **slu-*: Lat. *lutum*), ἰγνύς ‘knee-joint’).

Generally Greek has preserved the rather complicated sound-combination remarkably well; but sometimes a reduction has taken place. Besides **ghīōm*: *ghīō-* in χθών, χθόνιος, χθαμαλός we find χαμαί and χαμηλός with **ghm-*; these may be rather old forms (cp. e. g. the Indian, Latin, and German forms below), but (κατα)καίνω besides (κατα)κτείνω is probably a Greek development only. On the other hand it may seem plausible that (**g^hhīen*:) *g^hhīon* (: *g^hhīn*), the root of φθόνος, should have been reduced to **g^hhen*: *g^hhon*: *g^hhn-* in θείνω, etc.; but as the latter root is found in several other IE languages, the reduction—if any—must have taken place in Indo-European.

The effect of *h* before *i* is illustrated in the difference of development in **ghīōm*, etc., ‘earth’ with *-hi-* and in the word for ‘winter’ (*gh-i-m*) with *-i-*: χειμών ‘winter’, χειμερινός (*ghēim*), χιών/χιόνος ‘snow’ (*ghīōm*), χίμαρος ‘a one year old goat’ (*ghim-*).

It is remarkable that whereas *i* was found not to be influenced by preceding aspiration (κ_i and χ_i being treated in the same manner) *hi* can be aspirated: χθ and φθ are opposed to κτ. Evidently the reason is that *hi* in Pre-Greek times had developed into an affricate *dž*, so that an occlusive—which is affected by preceding aspiration—followed directly after the velar.

§ 10. II. Aryan and Armenian.

B. Aryan. (χθών) Skr. *kṣāḥ* (acc. *kṣāṃ*, gen. *kṣmāḥ/jmāḥ/gmāḥ*) ‘earth’, *kṣāmya-* ‘earthly’, Av. *zā*, *zam-* (cp. from the root of χιών Av. *zyā* ‘winter’ (**ghīō(m)*), Skr. *hemantá-* ‘winter’ (**ghēim-*), Skr. *himá-* ‘snow, winter’ (**ghim-*), Av. *zəmake* ‘winter-gale’ (*gh(i)m-*); (χθές) Skr. *hyāḥ* (Mod. Pers. *dī*) ‘yesterday’; (ἐρέχθω) Skr. *rákṣah* ‘evil spirit’, Av. *rašah-* ‘damage’;—(φθείρω) Skr. *kṣáratī*

'flows, streams', Prākṛ. *jharant-* 'rushing down', *jharā* 'waterfall', *jharī* 'river', Av. *γžar-* 'flows, streams'; (φθίνω) Av. *a-γžōnvamna* 'not disparaging himself' (? cp. from the root of θείνω Skr. *hānti*, Av. *jainli* 'beats, slays'); (φθίνω) Skr. *kṣiṇāti* 'annihilates' (*kṣītiḥ* = φθίσις; *kṣayáh*, cp. φθόν), Av. *xšī*, gen. *xšyō* 'misery'; (κτείνω) Skr. *kṣaṇóti* 'wounds', O.Pers. *axšata-* 'not wounded'; (κτάομαι) Skr. *kṣáyati* 'owns, reigns' (Av. *xšayeiti*), (*kṣatrá-* (Av. *xšaθra-*) 'dominion', O.Pers. *Xšayārsā* 'Xerxes'); (κτίζω) Skr. *kṣéti* (O.Pers. *šaeiti*) 'lives, dwells' (*kṣītiḥ* (Av. *šīti-*) = κτίσις; *kṣetra-* (Av. *šōiθra*) 'ground, residence'); (τέκτων) Skr. *tákṣan-* (Av. *tašan-*) 'carpenter'; (ἄρκτος) Skr. *ṛkṣa-* (Av. *arša-*, Mod. Pers. *xirs*) 'bear'; (ἰκτίνοσ) Skr. *śyená-* (Av. *saēna-*) 'eagle, falcon'.

In the combinations *ghī|ghī* and *khī|khī*, *h* has in Pre-Indo-Iranian generally combined with *i* into the emphatic palatal sound *ž*. We do not know whether it has at the same time aspirated the preceding *k-* or *g-* sound, since, under the given circumstances, no difference between aspirated and non-aspirated *k-* and *g-* sounds is directly observable; but the aspirating effect of *h* is probable, since it immediately appears, when, for some reason, the emphatic palatal sound is not formed.

Iranian, which possesses both voiced and voiceless sibilants, preserves *ž* after a *g-* sound, but naturally changes *ž* into *š* after a *k-* sound. Iranian too keeps up the difference between velar and palatal *k-* and *g-* sounds. Therefore Avestan has *γžar-*, *a-γžōnvamna* (with *g* < IE *g^h-*) as against *zā*, *zam-* (with *ǵ-*, but see below p. 21), and *xšayeiti* (*xšaθra-* (O.Pers. *Xšayārsā*)), *axšata-* (with *k-*) as against *šōiθra* (Av. *šaeiti*, *šīti-*), *tašan-*, *arša-* and *aši* 'eye', (with *k̄-*). In Av. *xšī*, *xšyō* we probably find *xš* instead of *γž*, because the root of φθίνω may have been mixed up with that of κτείνω. But *š* in Av. *rašah-* instead of a voiced sound is obscure.

Sanskrit has no voiced sibilants; *ž* is therefore changed into the unvoiced *š* = *ṣ*, and before this sound all *k-* and *g-* sounds have to appear as *k*, whether they are originally voiced or voiceless. velar or palatal sounds. Thus Sanskrit has *kṣáh* (Gen. *kṣmáh*: *kṣámya-*, adj.), *rákṣaḥ* with *k* deriving from *ǵ-*; *kṣáratī*, *kṣiṇāti* (*kṣīti-*, *kṣayá-*) with *k-* deriving from Satəm *g-*; *kṣaṇóti*, *kṣáyati* (*kṣatrá-*) with *k-* deriving from IE *k-*; *kṣéti* (*kṣīti-*, *kṣetra-*), *tákṣan-*, *ṛkṣa-*, and *ákṣi-* (*akṣnáh-*) 'eye' with *k-* deriving from *k̄-*. But

sometimes Pāli and Prākṛit have reminiscences of the former voiced sound: *jharant-*, *jharā*, *jharī* are Prākṛit-forms of the root of Skr. *kṣáratī*, φθειρω.

Reduction of the difficult sound-combination is found in the old genitives *jmáh* and *gmáh* besides *kṣmáh*: if *i* is eliminated in IE **ǵhīm-*, then in **ǵhm-* *h* has to be dropped, too, but the reason why the palatal character of the *g*-sound is still sometimes reflected (*jmáh*), and sometimes is not (*gmáh*), is obscure.

The Proto-Indo-Iranian form of Skr. *hyáh*, Mod.Pers. *dī* must have been **ǵhies*¹ (not **ǵhies*) with the same development of *ǵh* > *ǵh* > *h* as in *máhi*, etc. (p. 16 above).

In the word corresponding to ἰκτίνος (**k̄h̄īn-*) Indo-Iranian has metathesis and vocalization of *h*: **k̄īh̄in-* > Skr. *śyená-*, Av. *saena-* (the loss of *h* between *i* and *n* is regular).

The root **g^hhen* (possible reduction of **g^hhien*) is amply testified in Indo-Iranian: Skr. *hánti*, Av. *jainti*, etc.

It is more probable that Av. *zam-* derives from **ǵh̄iom* (intermediate stage **z̄zam*) than from **ǵhom* with loss of *i* (cp. *zyam-* 'winter' from **ǵh̄iom*).

C. Armenian. (ἰχθύς) *jukn* 'fish'; cp. (χιών) *jiwn* 'snow' (gen. *jean*) < **ǵh̄īn-*, *jmeṛn* 'winter' (< **ǵhimrino-*).—(φθειρω) *jur* 'water' (gen. *jroy*).—(κτίζω) *šen* 'inhabited, village'; (ἰκτίνος) *çin* 'kite, milvus regalis'; (ἄρκτος) *arj* 'bear'.

jukn has *j* < *ǵh* as in *jiun*, *jmeṛn*, *jet* 'tail' (cp. Av. *zaḍah-* 'pou-dex'); evidently in **ǵh̄ius* the *i* has been eliminated.

In regard to *jur* we remember that Arm. *j-* stands for Satəm *gh* (generally IE *g^h*) before *e* or *i* in cases like *jerm* 'warm' (Gk θερμός), *jin* 'stick' (-*i* < -*e* before -*n*; to Gk θείνω), *jil* 'sine-w' (< **ghislo-* = Lat. *fīlum*). Probably therefore *jur* 'water' goes back to **gh̄iōr* (cp. Indo-Iranian **ghies*) from **g^hh̄iōr-* with the *o*-degree of Gk φθορά and a sense akin to the Aryan words (Skr. *kṣáratī* 'streams', Prākṛit *jharī* 'river'). It has **ghi-* (Satəm **gh̄i-* < IE *g^hh̄i-*) and then *-ōr* from the synonym **uedōr* (cp. Gk ὕδωρ), which Armenian has preserved in *get* 'river' (from the sandhi-form **uedō*).

With *šen* we may compare *šek* 'reddish' < **k̄uoito-* (*šiknim* 'turn red') from the root IE **k̄ueit-* 'shine' (Skr. *śvetá-*, Goth. *hweits* 'white') and other words with *š-* < *k̄u-/k̄u-*, e. g. *šand*

'spark' < **kunti-* from IE **keu* 'shine' (Skr. *śudhyati* 'purifies', *śubhrá-* 'beautiful'), *šiw* 'dregs' < **kūibho-* from IE **kūei-* 'mud, dirt', cp. Lat. *inquināre*. The development of IE *k̄u-* in Armenian² presupposes that *-u-* in this combination turned into *ū* and thence into non-syllabic *i* or *š*; as *k̄-* is *s-* in Armenian, the development has been perhaps *kū* > *sš* > *š* (cp. p. 21 concerning Av. *zam-* < **zšam!*). If we presuppose the same development of *hi* after *k-* and *g-*sounds as in Indo-Iranian, viz. *-ž-* (after *k-*sounds *-š-*)—which is most probable—then we understand why *šēn* (< **sšēn* < **k̄hiōin-* = Gk κτιόνᾱ) has in Armenian the same initial consonant as the words with IE **k̄u-*, namely *š-* < **sš-*.

As to the difficult *çin* we observe that Arm. *ç-* is either *sk-* (at any rate before prepalatals): *çiw* 'roof' < **skeuā* (OI *skjá* 'barn'), or *ks-*: *çamak* 'dry', *çasnum* 'feel angry' (Skr. *kṣāyati* 'burns'), or *k̄-* before *a* (= *ū*): *çacnum* 'to fall' (Lat. *cadō*). It is not perhaps easy to find instances of *k̄i-*, but *k̄i-* is, of course, *si-*: *siwn* = Gk κίων 'pillar', and *k̄i-* is *ç-*: *çu* (= Skr. *cyuti-*) 'start', *çogay* 'I went' (< **kiou*). In the light of these facts it is perhaps the most probable assumption that *i* has been dropped and that initial *k̄H-* had the same development as *k̄* before *a*; we may therefore assume *çin* < **k̄iñ* < **k̄iñ* = Gk ικτιῖος.

The word for 'bear', *arj*, is difficult, too, especially because it certainly has been influenced by *arjn* 'dark brown' (from **argin* < **hr̥g^hen*, probably related to **hreg^hos*: Arm. *erek* 'evening', Skr. *rájas-* 'darkness', Gk ἔρεβος). We may further compare *sterj* 'sterile' (*-rj-* < *ri-*: Skr. *starí-* 'heifer', Gk στειρά), *anurj* 'dream' (*-rj-* < *ri-*: Gk ὄνειρος), *mrjinn* 'ant' (< **morui-*: Lat. *formīca*), *urju* 'stepson' (*-rj-* < *rdi-*, cp. *ordi* 'son' to Lat. *orior*, Alb. *rit* 'grow'). And so we see that Arm. *arj* presupposes **ar*(*i*)*o-*, but we do not know which sound—if any—occurred in primitive Armenian between *r* and *i*. At any rate, nothing precludes the origin in **rk̄hiō-* (= ἄρκτος, Skr. *rk̄ṣa-*).

§ 11. III. Several Indo-European Languages.

D. Albanese. (χθών) *de* 'earth, country', and probably the derivatives *demje* 'caterpillar', *demize/dimize* 'maggot'; (χθές) *dje* 'yesterday';—(ἄρκτος) *arí* 'bear'.

The δ - in δe is to be compared with the δ - of words such as δemp 'tooth' (\tilde{g} -; Gk γόμφος 'peg', Skr. *jám̄bha* 'tooth', O.Slav. *zqbŭ*), $\delta ender$ 'son-in-law' (\tilde{g} : Skr. *jám̄ātar-*, Av. *zāmātar-*, cp. Lat. *gener*), $\delta el'pεε$ 'fox' ($\tilde{g}h$: 'the yellow one', cp. Skr. *hāri-* 'yellow, golden', Gk χόλος 'bile', O.Slav. *zelenŭ* 'green'). That is to say that it represents \tilde{g} or $\tilde{g}h$ before δ . The word δe must originate from $*\tilde{g}h\delta n/\tilde{g}h\delta m-$.

dje has $\tilde{g}h$ before e as $djes$ 'caco' (Skr. *hadati* 'cacat', Av. *zadah-* 'podex'); it presupposes $*\tilde{g}hes$.

In δe and dje Albanese evidently has eliminated the i of $\tilde{g}hi$ and thus reduced the combination to $\tilde{g}h-$ (which in Albanese cannot be separated from $\tilde{g}-$); cp. Balto-Slavonic.

$ar\acute{i}$ probably derives from $*arhi-$ < $*arski-$ (cp. *hé* 'shadow': Skr. *chāyá*; *ah* 'beech': OI *askr*, Arm. *haçi*), which might be metathesis from $*arkš-$ with the same development of $-khi-$ as in Indo-Iranian (and partly Armenian).¹

E. Balto-Slavonic. ($\chi\theta\acute{\omega}\nu$) Lith. *žemė* (O.Slav. *zemlja*) 'earth, country', Lith. *žmogŭs* 'man', cp. Lith. *žiemà* (O.Slav. *zima*) 'winter', Lith. *žieminis* (O.Slav. *zimīnŭ*) 'wintry' (with $*\tilde{g}hei-$); ($\iota\chi\theta\acute{\upsilon}\varsigma$) Lith. *žuvis* 'fish';—($\tau\acute{\epsilon}\kappa\tau\omega\nu$) Lith. *tašyli* (O.Slav. *tesati*) 'to hew, cut'.

In Lithuanian $\tilde{g}/\tilde{g}h$ is \tilde{z} , in Old Slavonic z ; and in Lithuanian \tilde{k} , $\tilde{s}k$, $\tilde{k}s$ are \tilde{s} , in Old Slavonic s .

Hence it is no wonder that words with $\tilde{g}hi-$ have \tilde{z}/z , too, and that we find \tilde{s}/s for $\tilde{k}hi-$, but we are unable to tell the stages of development; there is no sure trace of i .

F. Teutonic. ($\chi\theta\acute{\omega}\nu$) Goth. *guma* 'man', OE *brýdguma* 'bridegroom' (cp. from the root $*\tilde{g}h-i-m$ 'winter', OI *góimánaðr* 'February' < Teut. $*g\delta n$ < Centum $*gh\delta m$ (= Gk χιών); OI *gymbri* 'one year old lamb' < Teut. $*gumr-$ < Centum $*ghimr-$; Dan. *gimmerlam* (1) id. (2) 'female lamb' < Teut. $*gimr-$ < Centum $*ghimr-$); ($\chi\theta\acute{\epsilon}\varsigma$) Goth. *gistradagis* 'tomorrow', OE *geostran* 'yesterday', OHG *gestaron*, OI *í gær*, Dan. *i gaar*;—($\iota\chi\theta\acute{\upsilon}\varsigma$) O.Swed. *gius* (Mod.Swed. *gös*): a special fish of the Baltic.

The stem of Goth. *guma*, etc., is Pre-Teutonic $*ghmn-$ < Centum $*ghimn-$ < IE $*ghimn-$; the stem of the word for 'yesterday' is Pre-Teutonic $*ghēs$ < Centum $*ghīēs$ < IE $*ghīēs$. Ac-

ording to the rule valid for Teutonic, *-i-* has been lost after a velar.² If O.Swed. *gius* should be an old Teutonic word, it must have apophony (Teut. **geus-*), but since it is only found in Swedish, it is more likely a loanword from a Baltic language (cp. Lith. *žuvìs*).

G. Celtic. (χθών) O.Ir. *dú* 'place' (gen. *don*), O.Ir. *duine* 'man', Cymr. *dyn*, Corn.Bret. *den* (cp. χθόνιος) (the word for 'winter' M.Ir. *gam* is difficult to handle, since it has been influenced by *sam* 'summer'); (χθές) O.Ir. *indhé*, Cymr. *doe*, Corn. *dvy*;—(φθίνω) O.Ir. *tinaid* 'evanescit',—(ἄρκτος) M.Ir. *art* 'bear', Cymr. *arth*.

As to the word for 'earth' Italo-Celtic out of **ghiōm* has developed a form with metathesis, **ghoim* (cp. below on Lat. *hūmānus*), and Celtic has thence formed the compromise-form **ghioim*-. Here *ghi-* must have developed into *d-*, and so we can account for O.Ir. *dú*, *duine*, etc. In the word for 'yesterday' we have **ghi* > *d-*, too; the Celtic form was **desī* < **ghieseī*. Correspondingly we have in M.Ir. *art* the development *-khi-* > *-t-*. O.Ir. *tinaid* is doubtful because of the *t-* instead of *d-*.³

H. Italic. (χθών) *hūmānus*, *humus*, *humilis*, *homō*, *nēmō* (cp. *hiems*, *hibernus*); (χθές) *herī*, *hesternus*; (φθείρω) *serum*; (φθίνω) *silis* 'thirst', *situs* 'rust, silt'; (κτίζω) *situs* 'place', *positus*, *pōnō* < **posinō*; (τέκτω) *texō* 'weave, construct'; (ἄρκτος) *ursus*.

As said with reference to O.Ir. *dú*, Italo-Celtic, besides the old form **ghiōm* 'earth', seems to have developed a form with metathesis **ghoim*. This survives in Lat. *hūmānus* (with *-ū-* < *-oi-* as in *plūrimi*, etc.). But Italic has then out of **ghiōm*/**ghoim* developed the compromise-form **ghom*: Lat. *humus*, *humilis*, and hence the apophonic **ghem*: **hemo* > *homo* (cp. *nēmō* < **nehemō*). Illustrative forms are *hiems* < Centum **ghiem* and *hibernus* < Centum **ghimr-*. In the word for 'yesterday' the *i* of the combination *ghi-* has been suppressed without metathesis, the Latin forms starting from Centum **ghes-* (cp. Albanese and Teutonic).

A comparison of *texō* with Gk τέκτων, Skr. *tákṣan-*, shows that Latin presupposes a development of *-khi-* much like that of Indo-Iranian, viz. > *-kš-*, but because Latin does not know any palatal sibilant, this sound has been replaced by the dental sibilant *s* in *texō*. Correspondingly: *ursus* < **orso-* < **orkso-*

< **rk̄so-* < **rk̄h̄io-*. Similarly we understand *situs* 'place' < **k̄h̄iito*, and *situs* 'rust, dregs, decay', *silis* 'thirst' < **g^uh̄iit-*, as also *serum* < **g^uh̄ier-* (if the connexion with φθείρει, Skr. *kṣarati*, is correct) —only in the two last cases we must remember that we have to expect a voiced **gž-*, but as voiced sibilants in the beginning of the word are unknown in Italic, this must first become **kš-* and then follow the development of this sound-combination, into *ks* (at the beginning of the word *s-*).

I. Tocharian. In combining A *śom^a* 'young man', *śomiⁿ* 'girl', B *śaumo* 'man' (pl. *śāmna* 'people') with the root of χθών, χθώνιος, etc., perhaps we should not stress the fact that the initial *g*-sound was IE palatal *ǵ*—which might involve serious difficulties in the placing of Tocharian within the IE languages—but more the origin in **ǵi-* < **ǵh̄i-*. It seems, however, difficult to form a sure judgment of these words, before more is known about the very peculiar sound development of Tocharian.⁴

§ 12. IV. Hittite (*š* < *H̄i* and *d̄i*).

J. Hittite. Of the words here directly concerned I should only venture to mention [*gimra*] (STURTEVANT) 'rus, plain', thus **ǵhim-* < IE **ǵh̄im-* with the same zero-grade as in Skr. *kṣmaḥ*, gen. of *kṣaḥ* 'χθών', but with the loss of *H* (i. e. the common Hittite delaryngealization; cp. § 19).

Another phenomenon of Hittite phonology may, however, be adduced in support of the proposed explanation of the development of IE *-h̄i-*.

It is well-known that Hittite has a peculiar *s*-derivative. This may have different origins, but in some cases it seems to come from IE *-h̄i-*:

da-ma-aš-zi 'presses, oppresses' (*ta-ma-aš-ta*, prt. 3. sg.; *ta-ma-aš-šir*, prt. 3. pl.) would then have the same stem as Skr. *damāyāti*, Lat. *domō*, OI *temja*, viz. **domaḥi-/domh̄i-*;

pa-a-aš-zi 'drinks, sips' < **poḥi-* as in O.Slav. *pojiti* 'give to drink', cp. Skr. *páyate*, *pāyáyati*;

ḥa-an-ša-tar 'family, descendants' < **ǵonh̄iotor* or **ǵonh̄ietor* (the question arises whether Skr. *jānitar-*, Lat. *genitor* are simple *seṭ*-forms (< **ǵenḥtor*) or might have an older *-h̄i-*, cp. *domitor* —*domō*);

kar-aš-mi 'cut' may originate from **korhi-*, cp. Gk κείρω < **kerni-* (then Skr. *kṛṣāti* is related to, not identical with the Hittite word);

ḫar-aš-zi 'ploughs' < **harhi-* like Goth. *arjan*, cp. Lat. *arō* < **arājō* < **harañion*.

The common Hittite *s* of inchoative function in *šal-li-eš-zi* 'is great, becomes too great' and in other derivatives of adjectives might thus—conceived as *-(e)hi-*—quit its relative isolation and be combined with the common Indo-European *-i-* denominative in such cases as Skr. *apasṛāti* 'is active' (from *apás-* 'active'), Goth. *armaiþ* 'has pity, commiserates' (from *arms* 'poor, miserable'), etc. Outside Hittite *-hi-* and *-i-* have fused, with the exception of the position after a velar.

Phonetically the development probably was: IE *-hi-* > Pre-Hittite *ž* > Hittite *š* > *s*. Whereas in Pre-Hittite *hi* at the beginning of the word fused with IE *i* into this sound (Hitt. *yukan* = Lat. *jugum* = Gk ζυγόν), the evolution was different in the middle of the word. Here there must have been the same development of *-hi-* as in Aryan in the position after a velar: the laryngealized *i* became an emphatic palatal, a voiced palatal sibilant *ž*. In Hittite the voiced sound then was unvoiced into the voiceless *š*-, just as Pre-Hittite *g* was unvoiced into Hittite *ḫ*.

Phonemically *š* has been mixed up with the inherited sibilant (IE *s*). This accounts for the Hittite use of characters containing *š* (*aš*, *ša*, etc.) to express the sibilant. As is generally assumed, the Hittite sibilant, even if expressed by characters containing *š*, phonetically may in all cases have become the dental sibilant, simply because this, in most languages, is the normal sibilant.¹

From the point of view of Indo-European morphology the assumption of the development *-hi-* > *-š-* would be most satisfactory. And it would corroborate the opinion of HOLGER PEDERSEN that Hittite did once possess a real *š*.

This was the position in the middle of the word. It would be desirable to find a parallel development at the beginning of the word; and I think we can. HROZNÝ, GÖTZE, and HOLGER PEDERSEN have combined Hitt. *ši-i-wa-az* 'day', *ši-i-wa-an-ni-is* 'god', and *ši-ia-a-ri* 'appears' with Lat. *diēs*, *deus*, *dīvus*, and Skr.

dīdeti 'shines, appears'. EHELOLF has furthermore adduced Hitt. *ši-ú-ni-iš/-aš* (with the derivatives *ši-ú-ni-ia-tar*, nomen abstractum, and *ši-ú-ni-aḫ-ḫa-ri*, verbum denominativum) as a second form of the word for 'god', and has made it probable that even a third form, the simple *ši-uš*, was used in the same sense. Originally the idea was that Hitt. *ši-* should originate from Pre-Hitt. *dī-* with *ži-* as intermediate stage: since Pre-Hitt. *dī* may be IE **dei*, Hitt. *šiwanniš* might be compared with Skr. *deva-*, Lat. *deus*, *dīvus*, OI *tivir*. But HOLGER PEDERSEN is certainly right in now deriving Hitt. *ši-* from IE *dīē-* and identifying the stem *šiu-* of the Hittite words for 'day' and 'god' with the stem **dīēu-* of Skr. *Dyáuḥ*, Gk Ζεύς (and Lat. *Diēspiter*).²

In *ši-ia-a-ri* the *-i-* may be late, having arisen in the hiatus, after the Hittite development $\bar{e} > \bar{i}$, but it is perhaps more likely that *-i-* is inherited: then it is the determinative *i* in parallelism to the determinative *u* in *ši-uš*, *ši-i-wa-az*, etc.; such change between *-i-* and *-u-* seems to be a rather common feature in IE words in Hittite (COUVREUR, BOSSERT, SCHWARTZ). At any rate, I should not derive *ši-ia-a-ri* from **dīā-*, but either from **dīu-ia-* (if COUVREUR is right in assuming $u\bar{i} > \bar{u}\bar{i} > \bar{i}\bar{u}$) or—perhaps more likely—from **dīē-ia-* with the same root form as in Lat. *diēs* and Homeric ἀρίζηλος 'very clear, brilliant' (provided the $\bar{\alpha}$ - of Doric $\bar{\alpha}$ -ζαλος is hyper-Doric: BOISACQ s. v.)³. In ἀρίζηλος the simple root form may be **dīē-* with *-hlo-* as suffix: **dīēhlo-* besides *deīēhlo-* in Gk δῆλος 'visible'—**deīēlo-* would probably have given **δεῖλος*, cp. τρεῖς < **treiēs*—but this does not imply that the \bar{e} - of Lat. *diēs*, Skr. *Dyáuḥ* (Hitt. *ši-ia-a-ri*, *ši-uš*, etc.) must necessarily have developed from *eh*!

However this may be, there can hardly be any doubt as to the initial consonant of Hitt. *šiuš*, *šiwaz*, *šiu-naš*, (*-iš*), *šiwannis*, *šiyari*: it must have been IE *dī-*, which, with *ži-* as intermediate stage, has developed into Hitt. *š-*.

The zero grade of the determinative **dīēi*, viz. *dī-*, might be present in the Sanskrit root *dī* (even if other explanations are here possible). And the zero grade of the determinative **dīēu*, in the antecorsonantal form **dīu-*, (as in Skr. *dyút*, *dyu-* 'splendour, heaven') is probably seen in the Hittite adjective *šuppi-* 'not under taboo, clean, holy, sacrosanct' < **dīu(t)bhi-*. (Further deliberations on these words are found in the Appendix).

The ζ of Gk Ζεύς, ἀρίζηλος is a development of $d\check{z} < \text{IE } d\check{i}$ —just as the ζ of ζυγόν, etc., is from $d\check{z} < \text{IE } h\check{i}$. And the š of Hitt. *šiwaz*, *šivanniš*, *šiunaš*, *šuppi-*, *šiyari* is from $\check{z} < \text{IE } d\check{i}$ —just as the š of *pašzi*, *damašzi*, etc., is from $\check{z} < \text{IE } h\check{i}$.

K. In summarizing this survey of the IE sound-combinations, which in Greek are χϑ, φϑ, κτ, in Sanskrit $k\check{s}$, we may state that the assumption of their origin in velar + $h\check{i}$ is in accordance with the known developments of i -combinations in Greek, with the Greek abolishment of palatal consonants, with the Greek system of dentals, and with the assumed origin of Gk ζ- (as against i - of the other Indo-European languages). As these sound-combinations are most fully preserved in Greek, the explanation above all has to fulfil the demands of this language. If $h\check{i}$ - in Proto-Greek developed into an aspirate $d\check{z}$, but in the other IE languages generally only into a sibilant \check{z} , this accounts for the opposition of Greek ζ- to the i - of the other IE languages. At the same time it accounts for the quite peculiar sound-combinations χϑ, φϑ, and κτ in Greek, whereas the corresponding sound-combinations of the other languages are less difficult.

But among these sound-combinations and sound-developments none are contradictory to what was found on the basis of Greek; moreover, most of them are rather easy to conciliate with the Greek findings; the Hittite facts are especially illustrative. It should not be forgotten, however, that it seems necessary to assume that the incidental aspirating effect of H upon g , which has hitherto been established only for Indo-Iranian, has been possible under certain conditions in all Indo-European languages, the fact that most instances have been found in Centum-languages being scarcely of importance.

Apart from Greek, Hittite, and Indo-Iranian, interesting developments are found in Armenian and Italo-Celtic, even if here early reductions have taken place—just as in the northern languages, Teutonic and Balto-Slavonic. From Tocharian the material hitherto available is rather scarce.

At any rate it seems possible to discard the IE symbol b/δ adduced to design a peculiar sound found only in these groups: it is not necessary to assume an unknown sound, only special combinations with the known phonemes H and i .⁴

§ 13. *h* before *u*.

Hitherto we have only considered the laryngeal phoneme before a consonantal sonant. However, the position before a vocalic sonant has to be considered, too; it cannot be separated from the position before any vowel.

Indo-European had the possibility of words with initial vowel without *h*-, and of words with initial vowel with *h*-, thus of words with *a*-, *e*-, *o*-, *i*-, *u*-, *ḡ*-, *ḷ*-, *m*-, *n*-, *ḥ*-, and of words with *ha*-, *he*-, *ho*-, *hi*-, *hu*-, *hḡ*-, *hḷ*-, *hm*-, *hn*-, *hḥ*-. Sometimes Hittite demonstrates this quite clearly; cf. */appa/* 'afterwards, again'—*/hanti/* 'before'; */estsi/* 'is'—*/henkan/* 'fate, death'; */arnu-/* 'bring'—*/hastai/* 'bone'; */uttar/* 'word'—*/huhhas/* 'grandfather'.

In Greek *a*, *e*, *o*, *i*, *u* were preserved, but *ḡ*, *ḷ*, *m*, *n*, *ḥ* developed into vowel (generally *a*) + sonant (or, sometimes, sonant + vowel (generally *a*)); e. g. ἄρκτος (*ḡ*), τάλαις (*ḷ*), ἑκατόν (*m*), ἄγνωτος (*n*), πατήρ (*ḥ*); in this connection we may leave the long forms out of consideration.

Furthermore, when consonantal *h* developed into a prothetic vowel, this acquired different qualities, mostly *á*:- ἄησι, ἄεσα, ἄεθλον, ἀμέργω, ἀμέλγω, ἀνήρ, ἀνεψιός, ἀλώπηξ, ἀλείτης, (ἀλοιτός, ἀλιτρός), ἄλεισον; not seldom *é*:- ἐννέα, ἐλαχὺς, ἐλαφρός, ἐλεύθερος (ἐλεύσομαι), ἐλινύω, ἔλεος, ἔρεβος, ἐρεύγομαι, ἐχθές; sometimes *ó*:- ὄνομα, ὀνίνημι, ὄνειρα, ὀλίγος; or even *i*:- ἰχθύς, ἰκτίνος, ἰκτίς, ἰφθίμος; never *ú*:-

The reasons for these discrepancies are obscure. It is evident that the quality of the neighbouring sounds plays a certain role: *á*- before *ḡ*, *i*- before *ḷ* and *ṽ* in the following syllable, sometimes *é*- and *ó*- before respectively *ε* and *ο* in the following syllable—cf. even such cases as ἐρέφω/ὄροφος—; but there may have been differences of quality of the *h*-, and there may have been sandhi-varieties, too. This is of minor importance in this connection.

What is of importance is the fact that initial *ha*- and *a*-, *he*- and *e*-, *ho*- and *o*-, *hi*- and *i*-, and the prothetic vowels originating in consonantal *h* have in primitive Greek fused into *á*-, *é*-, *ó*-, and *i*-. As Hittite gives no clear instance of *hi*-/*i*-, we may mention for *hi*:- Gk ἰαύω 'pass the night' < **hiḥu*(*s*) < **hihu*(*s*) to the root *hues*- in νύκτα . . . ἄεσα (cp. for the form-

ation ἴσχω < *hiskh- < *sisgh- to the root *segh-* in ἔχω); and for *i-*: Gk ἴθι, Skr. *ihí*, Hitt. *it*, imperative of εἶμι.

These forms, with spiritus lenis, are opposed to the same vowels with spiritus asper = *h-*, where this has developed from initial *s-*, *i-*, *u-* (or combinations of these sounds), cp. ἄζομαι (Skr. *yájati*), ἔξ (Lat. *sex*), ὄς (Skr. *syáh*), ἴστωρ (οἶδα, *vīdī*).

We have here a parallel to the initial sonants *r-*, *l-*, *m-*, and *n-*. We saw that primitive Greek must have had a triplicity *hr-/r-/hr-*, *hl-/l-/hl-*, *hm-/m-/hm-*, *hn-/n-/hn-*. This was reduced to a duplicity — in the cases of *l*, *m*, and *n* so that *l-* and *hl-*, *m-* and *hm-*, *n-* and *hn-* fused into *λ-*, *μ-*, and *ν-*, respectively, whereas *hl-*, *hm-*, and *hn-* were preserved as prothetic vowels + *λ-*, *μ-*, *ν-*; in the case of *r* so that *hr-* and *r-* fused into a prothetic vowel + *ρ-*, whereas *hr-* was preserved as *ῥ-*.

With the vowels *α*, *ε*, *ο*, *ι* it is mostly as with *ρ*: laryngeal element + *α-/ε-/ο-/ι-* and pure *α-/ε-/ι-/ο-* fused into *ᾱ-/Ί-/ῶ-/ῖ-*, whereas *hα-/hε-/hο-/hι-* are preserved as *ᾰ-/Ί-/ῶ-/ῖ-*.

The spiritus lenis is generally reckoned to be only a graphic expedient, Phoenician H having been split into *Ĥ* = ‘, spiritus asper, with a real phonetic value, and *Ħ* = ‘, spiritus lenis, without phonetic value.¹

Conditions with *u* are quite different. Indo-European *u* is Greek *υ*, but *υ* is never a prothetic vowel, and initial *υ* never has the spiritus lenis, but only the spiritus asper: *ύ-*.² The *h-* (= spiritus asper) is sometimes easily accounted for as originating from *s-*, *i-*, or combinations: *ῥς* (Lat. *sūs*), *υῖός* (cp. Skr. *sūnū-*, Goth. *sunus*), *ὑπερ* (Lat. *super*), *ὑπνος* (cp. Skr. *svápna-*, OI *svēfn*), *ῥει* ‘it rains’ (Skr. *sunóti* ‘extracts, presses out’), *ὑμεῖς* ‘you’, pl. (cp. Goth. *jus*), *ὑσμῖνη* ‘turmoil of battle’ (cp. Skr. *yúdhya* ‘fights’), *ὑμήν* (*si-* or *sh-*: Skr. *syáman-* ‘tie’). But in other cases *υ* simply stands for IE *u-*, e. g. *ῥδωρ* ‘water’ (cp. Skr. *udán-*), *ὑγρός* ‘wet, moist’ (cp. Skr. *ukṣáti* ‘sprinkles’). *ῥπο* (= Skr. *úpa*), *ῥστερος* (= Skr. *úttara-*), *ῥφαίνω* (cp. Skr. *ubhnāti*). We have no reason to believe that in Indo-European these words should have had another initial than simply *u-*, and as a corroboration we may, as regards *ῥδωρ*, point to Hittite *wa-a-tar/ú-e-te-na-aš* with the strong grades **uod-* (cp. Goth. *wato*, Eng. *water*) and **ued* as against the zero-grade **ud-* in the Greek and Indian words.

It should be noted that in primitive Greek *u-* and *hu-* have fused—just as *l-* and *hl-*, *m-* and *hm-*, *n-* and *hn-* have fused. But whereas these latter sounds have fused into the form without *h* (λ -, μ -, ν -), *u-* and *hu-* have fused into *hu-*. On the other hand, there is no direct evidence of *H* before *u*. It is clear that something must have happened to *hu-*, before the special development of *H* in primitive Greek began.

What indeed has happened we perceive when we start from the brilliant etymology of KURYLOWICZ: Hittite /*huhhas*/ (Luwian and Lycian *xuga-*; Γύγης!) — Lat. *avus* (*ava*, *avia*), O.Ir. *ave* ‘grandchild’ (Cymr. *ewythr* ‘uncle’, Bret. *eontr*), Goth. *awo* ‘grandmother’ (OI *ái* ‘great-grandfather’, Germ. *oheim*), O.Slav. *ujĭ* ‘uncle’, Lith. *avĭnas* (O.Pruss. *awis*).³

The IE form of this stem must have been **huho-*, and the Hittite and other “Anatolian” forms are those expected. But in Italo-Celtic and Balto-Slavonic *hu-* evidently became *hū-* (vocalization of *H* before *u* with the diphthong *hū* (= *au*) as the result). And in **hūho-* the *-h-* is regularly dropped between consonant and vowel.

The same development *hu* > *hū* (= *au*) we found in Gk *ἰάω* (p. 29). From the IE root **h₂ueh* in ἄησι ‘it blows’ we have the zero grade **h₂uh* as *hū(h)* in ἄρρα ‘blast’, ἄτμήν ‘breath, blowing’ (the loss of *h* between the consonants in *-hr-* and *-ht-* is regular). Skr. *usrá-* ‘belonging to the morning’ presupposes **h₂usr-*, just as Gk ἄριον ‘morning’ (< **h₂usr-*), whereas Gk (Homeric) ἦώς (Attic ἔως) is developed from **ah₂usōs-* (**ah₂usōs?*), Lat. *aurōra* probably too; Goth. **austra-* (*Ostro-*) < **h₂usro-* < **husro-* (cp. Skr. *usrá-*).

From the IE root **h₂ueg-* ‘grow, be strong’ we have the zero-grade **h₂ug-* in Skr. *ugrá-* ‘strong’ and, as **h₂ug-*, in Lat. *augeō*, Goth. *aukan*. With derivative *s*, we have **h₂eks-* in Gk ἄέξω, **h₂oks-* in Goth. *wahsjan*, the zero-grade **h₂uks-* in Skr. *ukṣáti* and, as **h₂uks-*, in Gk ἄξω.

The word ‘ear’ has the old form of the zero-grade **hus* in Av. *uši* and Armen. *unkn* (< **uson-ko-m*), the vocalized form **hūs* in Lat. *auris*, O.Ir. *au*, Goth. *auro*, and the *o*-grade **ohus* in Gk οὔς (Dor. ὤς), Alb. *veš*, O.Slav. *ucho*, and probably Lith. *ausis*.⁴

In Hittite we find *hu-u-uš-ki-ši*, 2. sg. ‘await’ (*hu-uš-ki-it*, prt.), with the derivative *-sk-*; this root *h₂ue:hu* has been combined

with Skr. *ávati* 'desires', *óman-* 'helpful', *avitár-* 'protector', *ūtíḥ* 'help', Lith. *aušlīs* 'recover', Gk *ἐνῆης* 'benevolent', Lat. *aveō* 'desire' (and *avārus, audeō*), O.Ir. *con-ói* 'servat', Corn. *awel* 'desire'.⁵ In these forms the stem has sometimes a derivative *h*, thus Skr. *ūtíḥ* < **hUH-* and the *set*-form *avitár-*; Gk *ἐν-ῆης* < -*ǎFH-* presupposes **ahUH-*. Lat. *aveo* and *avārus* have *au-* < *ḥu-* < *hu-*. Other forms may either have this last development or—when the language in question makes no difference between *au* and *āu*—have *āu-* < *ahū-* as in Greek, or metathesis of *h* (§ 15).

The equation Hitt. */huhhas/* = Lat. *avus* and the words subsequently quoted make it probable that whereas *h* in *hu* was preserved as consonantal in "Anatolian", primitively in Aryan and Armenian, too, *hu* generally became *ḥu* in Greek, Italo-Celtic, Balto-Slavonic and—perhaps—Albanese. Naturally, the *au* of several IE languages may sometimes be IE *au* and sometimes IE *ḥu*. But where the western languages have *au-* in forms corresponding to forms with *u-* in the eastern languages, it is probable that we have western *ḥu-* derived from IE *hu-* preserved as *ḥu-* in Hittite, as *u-* in the other eastern languages.

When *hu* had become *ḥu*, primitive Greek after the development of *h-* (< *s-*, *i-*), had no triplicity *hu-*, *u-*, *hu-* (as with the other vowels), but only the duplicity *u-*, *hu-*. And then, evidently, there was no inducement for *u-* to accept the spiritus lenis. If *u-* would not—as the only one of all vowels—preserve the pure vocalic beginning, there was no other possibility than fusion with *hu-* into this sound, or, in other words, than accepting the spiritus asper. So it has come about that all Greek words with initial *υ* have the spiritus asper. And further: when *u-* and *hu-* fused into *hu-*, initial consonantal *h*, being vocalized in Primitive Greek, had no possibility of assuming the quality of *u-*; this accounts for the absence of *υ-* as a prothetic vowel.

But then we must infer that the spiritus lenis was no mere graphic expedient, but a phonetic reality just as well as the spiritus asper. The spiritus lenis of Greek is a direct continuation of the Indo-European laryngeal phoneme. The fusion of *ha-*/*he-*/*ho-*/*hī-* and *a-*/*e-*/*o-*/*i-* into *ǎ-*/*ĕ-*/*ō-*/*ī-* is in fact the fusion of laryngeal initial and purely vocalic initial into laryngeal initial—in close parallelism to the development of initial *r* (p. 11 f.), where *hr-* and *r-* fused into *hr-* = prothetic vowel + *ρ*.

It has been assumed that initial *h* was lost before vowels in all IE languages with the exception of Hittite and the cognate "Anatolian" languages, and there is no doubt that this was the case in most of the said languages, e. g. in Indo-Iranian. But when we find that Greek has preserved the laryngeal element in this position, other IE languages might have done the same. In fact, we have an indication hereof in Teutonic.

In old Teutonic poetry we have either alliteration of consonants which must be identical, or of vowels which may be different: *há hét ek Friðþjófr, er ek fór með vikingum . . . Gunnþjófr, er ek gekk at fylki, Eyþjófr, er ek útsker vænta.*

It has long since been supposed that when this poetry came into existence, an identical sound was heard before every initial vowel, so that there was everywhere alliteration of identical consonants.⁶ In the light of the Greek development it is probable that this sound was a continuation of the IE laryngeal phoneme, and that Teutonic—just as Greek before α , ε , o , i —originally preserved the IE laryngeal phoneme, in some form or other, before all vowels and extended this to the cases where in Indo-European no laryngeal sound occurred before the initial vowel. It should be noted that Teutonic had the same opposition between the continuation of *h* and the new *h*- as Greek between the spiritus lenis and the spiritus asper.⁷

It is not strange that Teutonic has no separate treatment of *u*-; the remarkable thing is that Greek is so conservative as to keep up this special treatment of one vowel.⁸

§ 14. Celtic *hu*-, *u*-, *p*-.

In Celtic, a neighbouring language of Teutonic, we have a peculiar development of IE *u*-: in Old Irish this is *f*-, in Britannic *gu*-: IE $^{*(h)}u̯idheu̯ā$ is O.Ir. *fedb*, Cymr. *gweddw* 'widow', IE $^{*}u̯id$ - is O.Ir. *fid*, O.Cymr. *gwydd* (sg. *gwydden*, Mod.Bret. *gwezenn*) 'tree, wood'.

The Irish voiceless labiodental *f* is a direct development of a voiceless bilabial spirant $F = u̯h$, which again must have its origin in a voiced aspirated bilabial sound $u̯h̄$, since IE *u* was no voiceless sound.

The Britannc *gu* must originate from an emphatic or long *u* (cp. the North East Teutonic development *u* > *g'u*: OHG *hauwan*, OI *hoggva*; OHG *bliuwan*, Goth. *bligwan*); this may very well originate from the same voiced aspirated bilabial sound *uɦ* as the Irish sound.

As mentioned on p. 6, in Greek IE *hu-* developed into prothetic vowel + *h*, in Hittite into *hu-*. In all other Indo-European languages *hu-* and *u-* have fused, generally into *u-*, but in Celtic evidently into *hu-* > *uɦ*!

This has seemingly involved an odd consequence to the occlusives of Celtic. In this language the IE aspirated mediae fuse with the unaspirated mediae into the latter; cp. O.Ir. *bráthir* 'brother' (*bh*), *sliab* 'mountain' (*b*), *bó* 'cow' (*g^u*); *dínu* 'lamb' (*dh*), *dere* 'eye' (*d*), M.Ir. *gat* 'twig' (*gh*), *gam* 'winter' (*ǵh*), O.Ir. *gonim* 'wound, kill' (*g^uh*), *gúal* 'coal' (*g*), *ingen* 'girl' (*ǵ*).

In opposition hereto the tenues probably were aspirated—as in Teutonic,—even if the aspiration later lost its function and is not seen in the tenues preserved in Celtic, viz. *t*, *k*, *k^u*: O.Ir. *temel* 'darkness' (*t*), *carae* 'friend' (*k*), Cymr. *karn* 'hoof' (*k̄*), O.Ir. *cethir* (O.Cymr. *petguar*) 'four' (*k^u*).

But *p* is lost: *athir* 'father' (Lat. *pater*), M.Ir. *orc* 'swine' (Lat. *porcus*), O.Ir. *lethan* 'broad' (O.Cymr. *llydan*, Gaul. *Medio-lanum*; cp. Skr. *pṛthú-*, Lat. *plānus*). Phonetically we may fairly assume that the development was: *p* > *ph* > *F* > *h* > zero: the aspirated *p* became a spirant (cp. e. g. the same phenomenon in the Teutonic and the High German consonant shift), and the voiceless spirant became an *h*, which was finally lost (cp. the same phenomenon in Spanish *hijo* < Lat. *filius*).

Nevertheless, the question arises why this development took place in the case of *p*, and not in the case of *t* or *k/k^u*.

If the explanation given above of the Celtic development of IE *u* and *hu* is correct, and if we are right in surmising a Primitive Celtic aspiration of the Indo-European tenues, then Primitive Celtic had a voiced aspirated bilabial sound *uɦ*, and a voiceless aspirated bilabial sound *ph*. Certainly this latter sound is originally in opposition to the other tenues (*t(h)*, *k(h)*, *k^u(h)*); but what happened is that this opposition weakened, whereas a new opposition grew up, viz. to *uɦ*.

When *ph* is opposed to *uɦ*, this opposition of a voiceless

labial occlusive to a voiced labial spirant will be apt to acquire greater regularity through the loss of the occlusive element in the first member. This is the impulse which changes ph into $\underline{u}h = F$, thereby removing $p(h)$ finally from $t(h)$ and $k(h)$.

Furthermore, the relevant difference in the opposition $\underline{u}h$ ($< p$)— $\underline{u}h$ being voiceless—voiced, the non-laryngeal element may be neglected in one member of the opposition; so we get the further development of $\underline{u}h$ to h .

On the other hand, this is such gross negligence of the sound material, that h is now not only opposed to $\underline{u}h$, but to every vowel as well, and here with no clear definition of the opposition, because there must have been few cases of $h + \text{vowel}$ against the great number of pure vocalic initials. The conditions of existence of h are blurred, the function is dim, and the result is that h vanishes. This stage must have been reached in Primitive Celtic times, and so far the voiced aspirated $\underline{u}h$ ($< hu/u$) must have been preserved. But from then the developments are divergent: out of $\underline{u}h$ Old Irish makes $\underline{u}h = F > f$, and Britannic differentiates \underline{u} ($< \underline{u}h$) into gu .¹

§ 15. Metathesis of H .

A. It is a peculiarity of the Indo-European laryngeal phoneme that it is very apt to metathesis, especially so that it changes places with a sonant: generally speaking, this is the explanation of the difference between \bar{i}/\bar{u} in the "reduktionsstufe" and i/u in the "schwundstufe" in roots with "long" diphthongs, \bar{i} and \bar{u} presupposing iH/uH , but i and u presupposing hi/hu .

Evidently the laryngeal sound which is responsible for the long vowel after the liquid of such forms as Skr. $pṛṇāmi$ 'I fill'; $prāyāḥ$ 'mostly'; Gk $\pi\acute{\iota}\mu\pi\lambda\eta\mu\iota$, $\pi\lambda\acute{\eta}\rho\eta\varsigma$, Lat. *plenus*, *completus*, O.Ir. *lán* 'full' ($*pl-H$), passed before the liquid in Skr. $pūrṇā-$ ($< *pṛḥṇa-$ $< *pṛḥṇa-$ $< *pṛḥṇo-$). When and how the laryngeal sound was lost in O.Slav. *plünū*, Lith. *pilnas*, Goth. *fulls*—all originating in $*pṛḥo-$ $< *pṛḥṇo-$ —is hard to tell. The same is seen in Skr. $stṛṇāmi$, Gk $\sigma\tau\rho\acute{\omega}\nu\nu\mu\iota$ 'I strew', Lat. *strātus*, *strāmen* ($*str-H$) as against Skr. $stīrṇā-$ ($< *stṛḥṇa-$ $< *stṛḥṇo-$), and in Skr. $drāghmān-$ 'length', Gk $\delta\omicron\lambda\iota\chi\acute{o}\varsigma$ ($*dl-H$) as against Skr. $*dīrghā-$ ($< *dṛḥgha-$ $< *dṛḥgha-$ $< *dṛḥgho-$).¹

Very clear, in this respect, is the root 'to suck'. We have **dhen-* in Skr. *dhārú* 'sucking', Gk *Θηλή* 'mamma', Lat. *fēmina*, O.Ir. *dínu* 'lamb'; **dheni* in Skr. *dhāyú-* 'thirsty', Lett. *dēju* 'I suck', OHG *tāju*; **dh̥i-* in Goth. *daddjan* 'give suck', Dan. *dægge*; **dhui* > **dhi-* in OHG *tila* 'mamma', Alb. *del'e* 'sheep'; **dhuei* > **dhei-* in Skr. *dháyāmi* 'I suck'. But with *h* after the determinative sonant we have **dhih* in Lat. *filius*, Dan. *die*, 'suck', and Skr. *dhītá-*, p.p.

With the root 'to drink' we have *h* before the sonant (**rh̥i*) in O.Slav. *pojǫ*, but after the sonant (**rih*) in Skr. *pītá-*, Gk *πίνω*.

Illustrative, too, is the word for 'fire', **p-h-u*; the nominal substantive is an *r/n*-stem. The main forms are the following: **ronur* : Hitt. *pa-aḥ-ḥu-ur*; **ronuen-* : Hitt. *pa-aḥ-ḥu-e-ni*, loc., **ronun* : Hitt. *pa-aḥ-ḥu-na-a-z*, abl., and Goth. *fon*, nom.; **rhuu-* > **pun-* : Goth. *funin*, dat., *funins*, gen., *funisks* 'fiery' (and, perhaps, OHG *funcho* 'spark'—if *fancho* (Dutch *vonk*) is false apophony); **rhu-* > **pur* : Gk *πυρός*, *πυρί*—but with metathesis: **rur* : Gk *πύρ* > *πῦρ*; **riner* : OHG *fûir* (later *fiur*, Germ. *feuer*, Dutch *vuur*, Eng. *fire*).² It is not perhaps out of place to resume an old idea and combine herewith the word for 'clean, cleanse', which normally has the form **p-u-h*, thus **puh* Skr. $\sqrt{pū}$ 'to clean' (*punāti*, *pūtá-*, *pūyáte*), Lat. *pūrus*, **peu-* > **peu* : Skr. *pávate* (< **peuetai*); but the form **rhu* in Lat. *putus* 'clean', and **repu-* or **ronu-* in Skr. *pāvaká-* 'bright shining'.

Perhaps we may add here the old word for 'washing'. We have **lonu-* in Hitt. *la-a-ḥu-i* 'pours' and the corresponding zero grade **l̥nu-* in Lat. *lavō*. Metathesis is probable in Gk *λοέω/λούω*, and is obvious in the zero grade **luh-* of Lat. *lūstrum*.³

An uncertain, but, if true, very interesting case of metathesis of *h* is to be found in the Indo-European homonym **ǵ-n-h-u* (1) (with quantitative and qualitative apophony) 'knee': **ǵenhu* : Hitt. *gi-e-nu* (and perhaps Lat. *genū*? but this might go back to **ǵ̥n̥h̥ū*); **ǵonhu* : Gk *γόνυ*; **ǵnneu* : Goth. *knīu*; **ǵnhu* : Skr. *jñú-* (*abhijñú-* 'up to the knees'), Gk *γνύξ*. But with metathesis **ǵnhu* > **ǵhnu* (cp. §§ 7—11) in Gk *πρόχλυ* 'down on the knees' (and perhaps **ǵonhu* : Skr. *jānu*—if Brugmann's law is as dead as HIRT thinks); and with a still further regression of the laryngeal, which is threatened with extinction, **h̥ǵnu-* in Gk *ἰγνύη* 'knee-joint'; (2) (with only qualitative apophony) 'chin' **ǵenhu-* : Gk *γένυς*, Lat.

dentēs genuīnī (secondarily *gena*), O.Ir. *gin/giun*, Goth. *kinnus* (-*nn* < -*nH*-?); **gōnH(u)*: Lith. *žándas*; but with metathesis of *H* in **gōhn(u)*: Lett. *zuóds*, and with further regression: **ghenu-* or **guonu-* Skr. *hānu-*—which might thus have *h* < *g* because the latter sound was secondarily followed by *H*, exactly as in *duhitár-*, *mahát-*, *ahám*, mentioned in § 8 (p. 16).

B. On this background we may risk a tentative explanation of three well-known, rather odd words, viz. Skr. *ásṛk* 'blood', *yákr̥t* 'liver', *śákr̥t* 'dirt'. They are *r-n*-stems and probably all of them have had an *H* before the *r/n*.

Indo-European **esH̥* is clearly indicated in Hitt. *iš-ḫar* or *e-eš-ḫar*. In Gk *ἔαρ* (< **es̥r̥*) the *H* has been lost regularly; in the side-form *ἦαρ* (< **es̥H̥r̥*) there is metathesis of *s* and *H*. In Sanskrit we might have expected something like **as̥r̥* (cp. *sīr̥ṇa-* above p. 35), but evidently metathesis of *r̥* and *H* has taken place, and **es̥H̥r̥* has become **es̥r̥H̥*. Taking into consideration that in Indian an *H* secondarily placed after a *g* may be combined with this into *h* (*ahám*, etc.; above p. 17), we suppose that Indian **as̥r̥H̥* may appear as **as̥r̥h*. Now, according to a general law of Indian phonology, the different occlusives and aspirates in final position all develop into the pure tenues: *bhiṣáj-* is in final position *bhiṣák*, *vac-* is *vāk*, *dah-* is *dhak*. When the original sound was a voiced one, final media is an intermediate stage.⁴ Thus our hypothetic **as̥r̥h* has first to become **as̥rg* or—in case a palatal element is involved—**as̥r̥j*. The latter form (which perhaps presupposes a palatalization corresponding to that of the vocalized laryngeal, mentioned below, p. 51) naturally has not been preserved in final position, but has been carried into the middle of the word in the secondary, but old forms *as̥r̥jā*, instr. sg., and *as̥r̥jāḥ*, gen. sg. (Brāhm.). The latest stage of development in final position may be expected to be *ásṛk*; this is, indeed, the real Old Indian form of the word.

The Latin word *asser* (*asser*) is too uncertain to allow reliable conclusions in regard to its origin, but it cannot disturb the theory; the *a-* at the beginning of the word might be explained as in *aper* (OHG *ebur*).

Outside the nom. and acc. sg. we expect IE **esH̥(e/o)n-* and correspondingly find Hitt. *e-eš-ḫa-ni*, dat. (= *|ešh̥ni|* or *|ešhani|*).

In Sanskrit, where consonantal *h* is regularly lost between two consonants, we have the normal form *asnáḥ*, gen., etc. In Greek no forms outside the nom. acc. sg. are found.

The word in question for 'liver' perhaps had the IE form $*iek^uHr$. In Latin the *h* is lost: *jecur* (< $*iek^ur$). In Greek and Avestan there is metathesis between *h* and k^u (cp. the metathesis in Gk ἦαρ): Gk ἦπαρ, Av. *yākarə* (< $*ieuk^ur$). In Sanskrit probably the same metathesis with *r* took place as in $ásrk$: $*iek^uHr > \dots *iakrH > *yakra$, whence, through a reasonable dissimilation, the actual form *yákr̥t*.⁵ Outside the nom. acc. sg. Sanskrit has regularly—as with $ásrk$ — $*iek^uHn-$ > $\dots yakn-$: *yaknáḥ*, gen., etc., Latin correspondingly has *jecin(or)is*, and Greek has ἦπατος with the usual Greek substitution of an *nt*-stem for an *n*-stem.

The word for 'dirt' has in Sanskrit precisely the same development: $*kek^uHr > \dots *sakraH > *sakra > sákr̥t$; outside the nom. acc. sg.: $*kek^uHn-$ > $\dots sákn-$: *saknáḥ*, gen., etc. Of the same root are words like Lith. *šiklī* 'cacare' (*šikū*, 1. sg.), Gk κόπρος 'dirt' (< $*kok^uHro-$), O.Ir. *cechor* 'palus'.

The irregularity of Skr. $ásrk/asnáḥ$, $yákr̥t/yaknáḥ$, $sákr̥t/saknáḥ$ is very striking. We have Indo-European *r/n*-stems, and *nt*-stems, but we have no *rt*-stems, nor *rt/nt*-stems, and whichever we try among these expedients, the *-k* of $ásrk$, on this base, remains an insoluble riddle. The conclusion is obvious: the Indian irregularity has no morphological, but only a mechanical (phonological) explanation, such as the one here tentatively proposed.

There is no denying that this attempt is rather rash, but not, I think, haphazard. Nevertheless, there is still one difficulty to be accounted for. Not the Teutonic word for 'liver' $*librō$ (OHG *lebar*, OE *livor*), because, if it is cognate with the Indo-Iranian, Greek and Latin words, the basic form of the Teutonic word is $*lik^uHr-$ ($*lik^uHn-$), in regular apophony to that of the other languages, which then must have been $*liek^uHr/liek^uHn-$ with early loss of *l*-. But the Armenian word *leard* (gen. *lerdi*) points to a form with *-rt*, thus—against the solution here proposed—corroborating the originality of *-rt* in Skr. $yákr̥t$, $sákr̥t$ (and the *-nt-* of Gk ἦπατος).⁶

On the other hand the Armenian and Teutonic words might be of different origin (cp. Gk λιπαρός). And the explanation here

proposed has the advantage of explaining the three irregular Indian words in the same manner, and of accounting for the long vowel of Gk ῥᾱρ, ῥᾱπᾱρ, Av. *yākarə*. Furthermore, as one of these words, *ásrk*, is without doubt an *r/n*-stem in Hittite, it is most satisfying, if all three words can be referred to this old group, which has deteriorated in all Indo-European languages with the exception of Hittite.

Therefore, with due acknowledgement of all uncertainties, the explanation might perhaps deserve some consideration.⁷

§ 16. Phonetic Value of *H*.

The Indo-European laryngeal phoneme was a consonant, but could in some cases occupy the top of sonority, thus being materialized as a vowel. This vowel outside Aryan was generally an *a*, in Aryan generally an *i*. If, in some languages (Greek, Armenian), the *H* is secondarily vocalized, the vowel quality is indistinct, mostly *a*, sometimes *e* or *o*, rarely *i*, never *u* (above p. 6—12).

In the position after a vowel, the laryngeal disappears in most Indo-European languages, with lengthening of the preceding vowel; in Hittite and cognate languages it becomes a voiced, later a voiceless velar spirant (*h*). This development is very clear between vowel and consonant, whereas it is possible that—under unknown conditions—the laryngeal was sometimes lost between two vowels without leaving any trace.¹ The Indo-European laryngeal *H* has no distinct effect upon the quality of the preceding vowel.

Before a vowel, the development is in Hittite exactly as after a vowel, viz. into *h*. In the other Indo-European languages, initial laryngeal vowel and Indo-European pure initial vowel have fused, mostly into pure initial vowel (thus e. g. in Aryan), but sometimes primarily into laryngeal + vowel, which then, secondarily, developed into pure initial vowel (thus Greek and Teutonic). A special case is *hu*, which in some Indo-European languages has the same development as other vowels with preceding *H* (Hittite, Aryan, and probably Armenian), whereas *H* is apt to be vocalized before *u* in Greek and other Western languages. In

Greek and Teutonic there is an opposition between the voiceless laryngeal spirant (Greek spiritus asper, Teutonic *h*) and the sound that is identical with or has developed out of the Indo-European laryngeal (Greek spiritus lenis, in Teutonic the alliterating sound before initial vowel). The Indo-European laryngeal has no perceptible effect upon the quality of the following vowel: it is found indiscriminately before *a*, *e*, and *o*. When sometimes initial *a* materializes the grade of apophony, represented in the middle of the word by *e*, this cannot be due to the Indo-European laryngeal phoneme, but may be ascribed to a Pre-Indo-European sound.

Before the sonant *u* Indo-European *h* has been preserved in Hittite as *h*. Greek and Armenian have vocalized *h* before *r*, *l*, and *n*, Greek before *u* and *m*, too. The combination *hi* has developed into a voiced emphatic palatal sound that has fused with *i* into this sound in all Indo-European languages, with the exception of Greek, where *hi*- has become *z*-, and Hittite, where *-hi*- has become *-š*-. In Greek *hr*- and *r*- have fused into *hr*-. In Celtic *hu*- and *u*- have fused into *hu*-. In other cases *h* + sonant have fused with the following sonant into this sound. In primitive Greek there has been an opposition between *hr*-/*hl*-/*hn*-/*hm*- and *hr*-/*hl*-/*hn*-/*hm*-, much in the same way as the opposition between *h* and *h* before vowels.

We have no clear indication that the Indo-European laryngeal was ever, as a consonant, found in initial position before *s* or an occlusive; vocalized it may occupy the same positions as the other vowels.

After a consonant we have the following configuration: In Hittite *h* is preserved—as *h*—in the middle of the word between *s* and a vowel, perhaps sometimes, under unknown conditions, after other consonants, too. In the position between velar (pure velar, labiovelar, and palatovelar) and *i*, *h* combines with *i* to a voiced emphatic sound (as in initial position in Greek, and after a vowel in Hittite) and aspirates the preceding voiced velar (but not a preceding *k*); the sound-combinations that have sprung up in this manner (Greek $\chi\vartheta$, $\phi\vartheta$, $\kappa\tau$) are differently treated in the different Indo-European languages according to the special sound-laws of these languages. In Aryan *h* aspirates a preceding *g*, if secondarily placed between this sound and a vowel. In

Aryan, too, *h* may aspirate preceding tenuis (especially *k*). In other cases *h* is, in all Indo-European languages, lost in the position after a consonant without leaving any trace. But the loss is sometimes avoided through metathesis, as *h* is very apt to change its place with a neighbouring consonant, especially a sonant.

If we then, finally, raise the question which sound this *h* may represent, there can only be one answer: the Indo-European laryngeal phoneme was a voiced *h* [*h̥*]*—*well known from Indian and Czech,*—*which may conveniently be classified as the seventh Indo-European sonant.²

It is most probable that a sound becoming in one language a velar spirant, in another a vowel (cp. Hittite */hwanteš/*—Gk ἄησι), was a laryngeal. There is nothing to intimate that the laryngeal in question should have been an occlusive. On the contrary, there are indications that it was a spirant, e. g. the said development into a vowel or a spirant, and the strong tendency towards metathesis especially with a sonant (§ 15).

There are furthermore several reasons why we must assume the laryngeal spirant to have been voiced: (1) its tendency to disappear after a vowel with lengthening of this vowel—the widest spread and best known quality of the laryngeal; (2) its tendency towards fusing with the voiced sounds *i* and *u* combined with lengthening or emphasizing (above, p. 15 and 32); (3) its capacity for opposition to the voiceless *h*, as in the Greek oppositions spiritus lenis/spiritus asper and *hr/hr*, or the Teutonic opposition between what has developed into vocalic initial, and initial with *h* (above, p. 11 and 31); (4) its predilection for aspirating preceding voiced velar, as seen in Gk φθ, χθ as against κτ (above p. 19).³

It is true that in Aryan the laryngeal aspirates not only a preceding voiced velar, if secondarily placed after *g* (above p. 16), but also sometimes a preceding tenuis, especially *k* (Kuryłowicz, *Ét.* p. 47). Nevertheless it should be borne in mind (1) that this is by no means the only way in which Aryan aspirated tenuis come into existence, (2) that there is no sure indication of the same effect of *h* outside Aryan. It is not improbable that this is a special Aryan phenomenon, effective at a time when the laryngeal was still a consonant, but not unchanged: that indeed the Indo-European laryngeal was changed in Aryan before dis-

appearing, is clearly indicated through its being vocalized as *i* as against *a* outside Aryan.

When Hittite develops the laryngeal into the voiceless velar spirant *h*, the intermediate stage must have been [g], which seems in fact preserved in Luwi (and perhaps in Lycian: cp. p. 31 and note ³ to § 13). The transition from laryngeal to velar articulation in these languages of Minor Asia has a parallel in the development, in dialects of Western Jutland, of the Danish glottal stop—thus of a laryngeal occlusive—into a velar occlusive: common Danish *gul* ‘yellow’, pronounced [gʊˀˀh], is in West-Jutland *gugl* [gʊgʊh]. It is not invalidating, but reinforcing this point of view, that the inverse development of an oral occlusive into a laryngeal occlusive is possible, too; this is known in Cockney where *water* may be pronounced [ˈwɔˀˀə] and *chicken* as [ˈtʃiˀˀɪŋ].⁴

It is extremely probable that the Indo-European voiced laryngeal spirant has had a much more pronounced laryngeal articulation than the very weak [ɦ] occasionally appearing in Teutonic in such cases as Danish *Fru Hansen* [fru^hanˀˀsn] ‘Mrs. Hansen’, Dutch *de heren* [də^heˀˀrə] ‘the gentlemen’, English *beehive* [ˈbiˀˀaiv], German *freiheit* [ˈfraeɪ^haet]. Certainly it has been stronger, too, than the normal [ɦ] of Czech in words like *havran* ‘raven’, *uhel* ‘coal’, *hlava* ‘head’, *pohled* ‘view’, *hmyz* ‘insect’, *nehmotný* ‘immaterial’, *hněv* ‘anger’, *dohnati* ‘drive, incite’, *hrad* ‘castle’, *zahrada* ‘garden’. We should willingly accept the view that the Indo-European voiced *h* was almost of the same character as the Semitic voiced fricative laryngeal, denoted in Hebrew ך and in Arab ɣ.

§ 17. The Aspirated Mediae in Italic and Latin *h*.

It is generally assumed that the aspirated mediae of Centum-Indo-European, *gh*, *g^hh*, *dh*, *bh*, were unvoiced in primitive Italic. This assumption is mainly based (a) on the facts that in Latin these sounds are represented sometimes by the undubitably voiceless Latin *f*, and that more cases of *f* are found in the other Italic dialects; (b) on the consideration that in some cases Lat. *-b-* certainly and Lat. *-d-* perhaps developed out of

voiceless spirants through the same sonorization which changed an intervocalic *-s-* into *-z-* (and thence into *-r-*); (c) on the assumption that Latin *h* originated in *kh*, as in Teutonic; (d) on the parallelism with the Greek development of the aspirated mediae into χ , ϑ , ϕ .

Nevertheless, certain difficulties are connected with this view. First, Italic originally had very few special conformities with Greek, but many with Celtic (and some with Teutonic); and in Celtic (and Teutonic) we find no unvoicing of the aspirated mediae. Secondly, there is no phonetic need of assuming *kh* as the previous stage of Italic *h*; the *h*-sound may be of different origin. Thirdly, it is assumed that in such cases as *ruber*, *nūbō* a previously voiceless *-f-* ($\langle p \langle th \langle dh$, or $\langle ph \langle bh/g^u h$) was sonorized into *-b-* (and then developed into the occlusive *-b-*) in the same manner as *s* was sonorized (and then rhotacized) in cases like *mūrēs*, *honōrēs*;—but this assumption is no more likely than the opposite one, viz. that Italic *-s-* was sonorized between vowels, because in this position primitive Italic possessed one or more voiced spirants (*b*, *δ*). Fourthly, details of the assumed development are hard to believe: when *-g^uh-* turned into *-g-* in cases like *nivis* (gen.), *foveō*, there is really no room for an intermediate stage *k^uh/kh^u*; and the assumption is preposterous in cases like *grāmen*, *gliscō* where initial *gh* has turned into *g*: how could the “sonorization” here be accounted for?

I should venture to set forth the hypothesis that in Pre-Italic the first stage of the development of the aspirated mediae was the change of the aspirated voiced occlusives into aspirated voiced spirants, i. e. the same stage as that presupposed by the Teutonic development of the mediae aspiratae into voiced spirants. The aspiration is preserved in some cases with the velars, but has almost completely disappeared with dental and labial spirants. The resulting voiced spirants have been unvoiced in initial position; in the middle of the word they have, in various ways, been discarded altogether in Latin—especially through their being changed into occlusives, as in Celtic and (later and partially) in Teutonic,—but they have often been preserved outside Rome. After the rhotacization of [*z*] (*mūs*, *mūris*), Latin has no voiced spirants, and Latin *s* has only the value of the voiceless [*s*]; but where, outside Rome, no rhotacization takes place, the letter

s has the value of both unvoiced [s] and voiced [z]. In conformity herewith, the Latin letter *f* has only the value of the voiceless [f], but outside Rome the letter *f* has a double value: voiceless [f] and voiced [v] (the voiced labiodental spirant, different from the bilabial [w], which is rendered by the letter *u/v*).

These general lines will, probably, appear more clearly after a detailed statement.

The facts to be explained are, briefly, the following:

Centum-Indo-European *gh* is before and between vowels Latin *h*, before and after voiced consonant *g*, before voiceless consonant *c*;

g^hh is in initial position *f*, between vowels *u*, after *n gu*, before voiced consonant *g* (but outside Rome *f*), before voiceless consonant *c*;

dh is in initial position *f*, between vowels (not after *u*) *d*, after *u b*, before and after voiced consonant: generally *b*, but after *n f* (in the last four cases outside Rome *f*), before *t, d, s* it is *s*;

bh is in initial position *f*, between vowels, before and after voiced consonant *b* (but outside Rome *f*), before voiceless consonant *p*.

Centum-Indo-European *gh* at the beginning of the word before vowel, and in the middle of the word between vowels, probably with the Pre-Italic aspirated voiced spirant [gʰi] as intermediate stage, develops into voiced [fi]: the velar element is lost, and the laryngeal element remains. At the beginning of the word we have a partial unvoicing resulting in the Italic sound written *h*: *hostis, hiems, hiāre, humus* (Osc. *hondra* 'intra'), *prehendō, nihil, mihi, vehō*. No *h* is written in cases like *nēmō* (< **nehemō*), *ānser*; an unhistoric *h* is written in cases like *humerus* (< IE **omesos*), *hauriō* (? < **auziō*). We shall later have to make some observations on the phonetic value of Latin *h*.

Before and after a consonant the aspiration (the laryngeal element) of [gʰi] is lost and the velar element preserved, but manifested as a voiced occlusive: *gradior, grāmen, gliscō, longus, spargō, angō, fingō*. Sometimes assimilations have taken place which are easily accounted for, in assuming the primitive Italic value of *gh* as a voiced spirant [g]: *trāma* (< -*ghm*-), *mille* (< -*ghzl*-). Before a voiceless occlusive (*t*) we have *c*: *vectus*,

lectus; probably the development was [gt] > [xt] > [kt]. We may compare that in modern Danish, words like *bugt* 'gulf', *agt* 'intention', *ægte* 'genuine', *røgte* 'to take care of, to tend', *vigtig* 'important', are pronounced, by the older generation with [xt], by the younger people with [kt].

With Centum-Indo-European $g^u h$, Pre-Italic $g^u \hat{h}$, the velar element is lost in initial position, before vowels and consonants alike, leaving a voiced bilabial spirant $u\hat{h}$. This sound is here, at the beginning of the word, and in opposition to the inherited unaspirated $u-$ (< IE $u-$ and $hu-$), unvoiced into $uh = [F]$; according to a general phonetic tendency, the voiceless bilabial spirant then develops into the voiceless labiodental spirant $[f]$: *formus*, *fragrāre*. This is certainly the first origin of the Italic sound F/f , which, during the history of the Italic languages, was to attract and absorb other sounds.

Centum ghu and gh before u coincide with $g^u h$: *fax*, *ferus* (ghu ; intermediate stage $qu\hat{h}$), and *fundō* (ghu ; intermediate stages $g^u hu > g^u \hat{h}u$).

In the middle of the word, the velar element is lost between vowels only, leaving the same voiced bilabial spirant $u\hat{h}$. Here there is no impulse towards unvoicing, but the voiced aspiration is absorbed through the vowel, and the result is that $-u\hat{h}-$ fuses with the inherited $-u-$ into this sound: *nivis* (gen.) and *foveō* (IE $-g^u h-$) have the same intervocalic sound as e. g. *aevum* (IE $-u-$). Similarly, the velar element is lost in Centum $-ghu-$, too: *levīs* and *brevis*; this, according to the explanation here proposed, is quite natural, but if $-gh-$ were to pass into $-kh-$, it would be rather puzzling.

Before and after a consonant in the middle of the word, the laryngeal element (the aspiration) is lost. After a consonant—only instances after n seem to be known—the labiovelar element is preserved, but manifested as an occlusive; the result is $-gu-$: *ninguit*, 3. sg., *anguis*.¹ Before a consonant, we have the same development into an occlusive, but here the labial element is lost; the result is g : *fragrāre*, *muger* (< $*mug^u hro-$). If the following consonant is voiceless, the outcome is c : *nix* ($-g^u hs$).

Outside Rome we sometimes find an $-f-$ instead of Latin $-g(u)-$. It is clear that this is here no previous stage in regard

to the Latin sounds, but a development in conformity with that of the beginning of the word. It may happen that such a word creeps into Latin, e. g. *mufrius*.

Whereas *ghu* is normally treated as *g^hhu*, the same labialization of *gh* may sometimes, though less regularly, intrude, if the following syllable contains another labial or rounding element: words like *fovea*, *fel*, *faucēs*—with *f*- instead of *h*-—have probably Centum-Indo-European *gh*, and *fuma* 'terra' (cp. *humus*) has primitive Italic *gh* (Indo-European *ghī*). Sporadic cases are such as *fostis* = *hostis*, *folus* = *holus*, *fordeum* = *hordeum*, *fariolus* = *hariolus*, *faedus* = *haedus*, *fircus* = *hircus*. Perhaps some of these are due to converted orthography, if the assumption is correct that in vulgar Latin, initial *f*- had a tendency to be lost. But if the *f* was really pronounced in such words, they display a spread of initial labialization.

With *dh* and *bh* few traces of aspiration proper are left; the old symbol *FH* (*FHEFHAKED*) might be interpreted as aspirated *F* or *f*.

With *dh* we expect primitive Italic *ḍ*, but the voiced dental spirant is always eliminated in Italic. At the beginning of the word **ḍ* was unvoiced and became *f*:- *faciō*, *fēci*, (Umbr. *feitū* 'facito'), *fēlāre*, *fīlius*, *fortis*, *fūmus*, *suffiō* (-*fī*- < -*dhūi*-; cp. Skr. *dhūyāte* 'is shaken'). It is possible that the intermediate stage between *ḍ*- and *f*- is *p*-—the development *p* > *f* is known from many languages, e. g. Russian;—but it is not excluded that the development might have been (1) a voiced dental spirant *ḍ*, (2) a voiced labiodental spirant [v], (3) a voiceless labiodental spirant *f*. If such is the way of development, then the transition from *ḍ* to *v* is parallel to the transition of *gh* to *g^hh* in words like *fundō*, *foveō*, *fel*, *faucēs*: *g^hh* and *v* display a labialization which *gh* and *ḍ* lack. A form like *horctus* = *fortis* may show the vulgar Latin tendency towards the effacing of *f*- (cp. above under *g^hh*).

Between vowels (with the exception of the position after *u*), the voiced dental spirant -*ḍ*- turns into the voiced dental occlusive -*d*- (cp. the occlusive in *gh/g^hh* before and after consonants): *aedēs*, *vidua*, *medius*; probably we have the same development in rare cases after an occlusive: *abdōmen*.

Outside Rome we find -*f*- for -*d*- in this position: Osc. *me-*

fīā (with $f = [v]$) is related to Lat. *medius*. Here it is obvious that $-ō-$ has changed directly into $[v]$.

In Rome we have this last development of the voiced dental spirant into the labiodental one after the rounded vowel *u*, and as Latin does not preserve any voiced spirant, with the further development of the labiodental spirant into the labial occlusive $-b-$: *jubeō* (cp. Lith. *judiēti*), *ruber*, *ubī* (cp. O.Slav. *kūde*). But outside Rome the stage of the voiced labiodental spirant $[v]$ is preserved, cp. Osc. *puf*, Umbr. *pufe* 'where'. Latin *rūfus* ($f = [f]$) must come from a non-Roman dialect (with $f = [v]$).

In consonantal surroundings, Latin has the development $-ō- > [v] > -b-$ in the combination $-ndhū-$, before and after $-r-$, and before $-l-$ (examples after $-l-$ are missing): *lumbus* ($< *londhuo-$), *glaber* ($< *ghladhro-$ cp. OI *gladr*), *fibra*, *arbor*, *verbum*, *stab(u)lum*—but Osc. *staftatas-set* 'statutae sunt' preserves the stage $[v]$.

After *n* we find $-f-$ even in Rome: *inferus* (*infra*, *infirmus*), *infula*; $-ō-$, as in the other instances of consonantal surroundings, hitherto mentioned, passed into $[v]$, and then in Latin was unvoiced. When, as is evident, the language would not here permit the change into the labial occlusive, there was no other way out than the voiceless $-f-$, since Latin has no voiced spirants.

Before *t*, *d*, *s* the dental spirant ($< dh$) is changed into the dental sibilant; this development is Pre-Italic, found more or less in Celtic and Teutonic as well.

The combination $-dht-$ turns into $-ss-$: *jussus* (cp. also $-dt-/-tt- > -ss-$).

The only sure example of $-dhd-$ is probably *crēdō*. The basic form is $*kred-dhē-$ (cp. Skr. *śrad-dhā*), but Italic has evidently (just as Avestan) changed this into $*kredhd-$, which becomes $*kreōd- > *crezd- > crēd-$ (cp. *nīdus* $< *nīzdo-$).

Before *s* we have $-dhs- > -ss-$ in *jussi* (*s*-aorist), *russus* (?; derivative $-so-$?), and hence loss in *aestas/aestus* ($*aiḍhs-tāt-/-tū-$).²

With *bh* we expect, at the beginning of the word, the voiced bilabial spirant \bar{b} , which—precisely as $\bar{u}h < g^u h$ —was changed into $F- > f-$: *fero* (Umbr. *fertu*), *fuī*, *frāter*, *flōs*. Instances like *haba* = *faba*, *hordus* = *fordus*, *hebris* = *febris* may display the vulgar Latin tendency towards the loss of $f-$.

In the middle of the word we find everywhere $-b-$: *nebula*,

nūbō, lubēt, umbō, albus, -bām, impf. and *-bō*, fut. (probably < *-bhū-*: cp. *superbia*, with *-b-* < *-bhū-*); before voiceless consonant, though, we find *p*: *nūptus, nūpsī*. Sometimes perhaps the direct development *-ḅ-* > *-b-* has taken place (cp. *-ḍ-* > *-d-* between vowels); sometimes the development may have been *-ḅ-* > *-[v]-* > *-b-* (cp. *-ḍ-* > *[v]* > *-b-* in the neighbourhood of most consonants). As for Latin we probably cannot decide which road was taken in the individual cases. Outside Rome the stage of the labiodental spirant in the middle of the word is clearly demonstrated in cases like Osc. *fufans*, 3. pl. 'erant', Faliscan *pipafo* 'bibam'; a name like *Alfius* is non-Roman.

In looking back upon this material, I hope the explanation here given will be found more coherent and adequate than the older assumption.

With regard to the phonetic value of Italic and Latin *h*, there can be no doubt that in initial position it was, at least partly, voiceless, because Latin *h* transcribes the Greek spiritus asper and affords the base of the *h*-rune of Teutonic. But we have no right to assume that in the middle of the word Latin *h* was ever voiceless (the late and learned forms *michi* and *nichil* do not count); it was here certainly a voiced *h̄*. And in initial position, too, Latin *h* must partly have been a voiced sound: it is throughout the development of the Latin language a very weak sound, and in the living language hardly to be distinguished from a vocalic beginning. In the late stages, already in vulgar Latin of the classic period—to say nothing of the pre-stages of the Romanic languages—*h-* disappeared totally as a phoneme. And in the early stages, the same comes true: *h* did not prevent elision or hiatus, and from the very beginning of our literary texts there is uncertainty as to the placing or non-placing of initial *h-*. This is perfectly natural, if we assume Latin *h* to have been an originally voiced *h̄*, which, in initial position, was partly unvoiced—perhaps originally conditioned through sandhi: the unvoicing of *h̄-* need not be completely parallel with the unvoicing in initial position of the voiced spirants proper, *uḥi/b[v]*.

Italic *h̄* developed out of Centum-Indo-European *gh* much in the same way as Sanskrit *h*, which is a voiced sound, developed out of Indo-Iranian *ḡh*.

Between the Italic and the Indian sound there is the difference that in Old Indian *h* is never confused with vocalic beginning, as is very often Italic *h*. We have seen that Indian had the pure vocalic beginning—Indo-European *H* + vowel and pure vowel being fused into pure vowel in Indo-Iranian (p. 39 above),—and hence it stands to reason that the voiced *h* [*h̥*] and vocalic beginning are kept clearly apart in Indian.

When, on the other hand, they are from the beginning easily confounded in Italic, this might be explained in the light of the conception of Indo-European *H* as voiced *h̥*, viz. through the assumption that in Italic, as in Greek and Teutonic, *H* + vowel and pure vowel had fused into *H* (= *h̥*) + vowel. The difference between Italic *h* (< *gh*) before vowel and inherited initial vowel would then, in primitive Italic, have been the existence or absence of the velar element, later only the partial unvoicing of *h* as against the constant voicing of initial vowel.

But I do not by any means wish to stress this assumption. It is certainly dependent upon the new hypothesis of the development of the mediae aspiratae in Italic; but this hypothesis is not dependent upon the rather uncertain assumption with regard to the initial vowels of Italic.

One supplementary remark is necessary. As far as I can see, nothing proves that *H* + vowel and pure vowel had in Celtic fused into *H* + vowel; but neither is the opposite development, fusion into pure vowel, proved; both possibilities are open. If we are right in assuming that in Celtic *H* + *u*- and pure *u*- have fused into *H* + *u*- (above p. 34) and that in Celtic and Teutonic *Hi*- and pure *i*- have partly fused into *Hi*- (p. 50 with note and p. 60), this might be an indication of the same Celtic development before vowel—in accordance with what is the case in Greek and Teutonic and, as we have just seen, perhaps in Italic, too. Thus the possibility arises of assuming that *H* + vowel and pure vowel have fused into *H* + vowel in the Centum languages as against the fusion of *H* + vowel and pure vowel into pure vowel in Aryan and the other Satəm languages.

As is self-evident this is no statement, but merely an indication of a field of research which might deserve further investigation.

§ 18. Indo-Iranian $H > i / e > a$ and Middle High German e / \ddot{e} .

Labialization is an outstanding feature of the Centum-languages, which not only preserve the Indo-European labiovelars, but in many cases develop them into pure labials, thus very often in Greek (βούρ, ποῦ, φόνος), sometimes in Celtic (O.Ir. *bó* 'cow', O.Cymr. *petguar* '4'), Teutonic (Goth. *fidwor*, *wulfs*), and Italic (Latin *formus*). We have furthermore the widely spread labialization of dentals and velars in Italic: Lat. *faciō* (*dh-*), *fundō* (*ghu-*), *fel* (*gh*). A third instance is the labialization of the vocalic sonants *r*, *l* in Teutonic and (in most cases) Italic, of *m*, *n* in Teutonic: OHG *furt* 'ford', Lat. *portus* 'port' (but O.Cymr. *rit* 'ford'), Goth. *hulþan* 'to cover', Lat. *occultus* (but O.Ir. *clethi* 'celandum'), Lat. *cor*, *cordis* (but O.Ir. *críde*, Gk καρδίη, καρδίη), Lat. *mollis* (but Gk ἀμαλδύνω, Skr. *mrdí-*)—Goth. *kuman* (but Lat. *veniō*, Gk βάλνω; cp. Skr. *agamyát*), Goth. *hund* '100' (but Lat. *centum*, O.Ir. *cét*, Gk ἑκατόν), Goth. *un-* (but Lat. *in-* < *en-*, O.Ir. *an-*, Gk ἄ(v)-).

In return the Centum-languages are often inimical to palatals: the Indo-European palatovelars are materialized as pure velars. Greek has no palatals, not even *i* (cp. above p. 13). In Latin *i* is only preserved at the beginning of the word (*jecur*, *jugum*) and after a consonant if this is itself lost (*peior* < **pediōs*). In Celtic *i* is lost in intervocalic and postconsonantal position, in Old Irish at the beginning of the word, too (*óac* 'young'). In Teutonic *i* is preserved at the beginning of the word in most languages, but regularly lost in North Teutonic (OI *ár* 'year') and partly in Old High German (*ener/jener*)¹; postconsonantal *i* is originally preserved in the middle of the word, but lost or transformed at the beginning of the word (cp. above p. 4). In the development of the sound-combinations velar + *hi* the Centum-languages clearly show their aversion to palatalization; above p. 23 f.

Palatalization, on the other hand, is the well-known characteristic feature of Satəm phonology. The Satəm-languages develop the Indo-European palatovelars into pure palatals (if they turn them into palatal sibilants the final stage may be the normal sibilant, viz. the dental sibilant). In Aryan, Satəm velars are split up into velars and palatals: Skr. *c*, *ch*, *j*, *jh*; and Satəm

dentals into pure dentals and palato-dentals: Skr. *t*, *!h*, *d*, *dh*, *ṅ*, *ṣ*. In Armenian intervocalic *t* becomes *i*: *bay*, gen. *bayi* 'word' (Gk φάτις). In Albanese *s* is very often palatalized: *ší* 'rain' (cp. Gk ῥεῖ), *veš* 'I dress' (Skr. *váse*), *ašt* 'bone' (Skr. *asthán-*, Gk ὀστέον), *miš* 'meat' (Skr. *māṃsá-*, Goth. *mimz*, O.Slav. *meso*). Balto-Slavonic has not only many palatal sibilants, but the difference between palatalization and non-palatalization is the broad and deep fundament of the whole consonantal structure, especially of Slavonic.²

This tendency towards palatalization has, seemingly, had a curious effect in one Satəm-language, viz. in Aryan, where even the laryngeal is affected by the palatalization. It is not improbable that the consonantal laryngeal had a palatal tinge (cp. *asṭjā*, above p. 36)—and if this is so, then all Aryan consonants with the exception of the labials displayed the influence of the tendency towards palatalization. But it is unmistakable in the vocalic form of the laryngeal, which is in most cases in Aryan *i* as against *a* in the other IE languages.

Thus, in primitive Aryan, the vocalic laryngeal (the laryngealized vowel *ḥ*) was exposed to palatalization and was gradually changed from a non-palatal to a palatal vowel, ending up finally in the palatal vowel proper, viz. *i*. During this development it must have come close to IE *e*—and this perhaps is the reason why this sound, to keep clear of the new palatal vowel, makes the Aryan transition to *a*.

It is true that not only IE *ē* becomes Aryan *ā*; *ō* and *ā*, too, are realized as *ā*: Skr. *bhārāmi* (Gk φέρω), *áṣṭau* (Lat. *octō*), *ájra-* (Lat. *ager*), *nā-* (Lat. *nē*), *jñātá-* (Gk γνωτός), *mātár-* (Lat. *māter*). But fusion of *ō* and *ā* is very common in Indo-European. We know this phenomenon from Hittite (*ō* and *ā* = *ā*), Tocharian (*ō* and *ā* = *ā*), Celtic (*ō* and *ā* = *ā*), Teutonic (*o* and *a* = *a*, *ō* and *ā* = *ō*), Albanese (*o* and *a* = *a*), Balto-Slavonic (Baltic *o* and *a* = *a*, Slavonic *o* and *a* = *o*; Lett. Pruss. *ō* and *ā* = *ā*, Slav. *ō* and *ā* = *a*).³ With regard to the circumstance that not only short *o* and *a*, but often long *ō* and *ā*, too, coincide, we may observe that in Hittite differences of vowel quantity are perhaps never quite clearly discernable and must in many cases be improbable, since a main reason for the length of IE vowels is the vocalization and later disappearance of postvocalic

H, whereas Hittite in this position generally retains the consonantal character of *H* (Hitt. *ḫ*). In several other IE languages the coincidence of *ō* and *ā* may have taken place before the long vowels had developed out of *oh/ah*. In Aryan this most certainly was so, since the stage of vocalized, but not absorbed *H* is preserved in those cases where R̥g-veda has hiatus *a—a* (*i—i, u—u*) instead of the later long *ā* (*ī, ū*); naturally, this applies to IE *eH* just as well as to *oH* and *aH*.

A singular phenomenon, unique in ancient Indo-European phonology, is the general fusion of *e* and *a* into this latter sound in Aryan. And this phenomenon has not taken place at a very early stage of Aryan, since it is later than the effect of the famous Palatal Law concerning the splitting up of Satəm velars into velars and palatals: *k* is preserved before an Aryan *a*, going back to IE *o* or *a*, but changed into *c* before an Aryan *a*, going back to an IE *e*. The fusion of *e* and *a* into Aryan *a* must thus have taken place some time after the isolation and constitution of Aryan and must be due to a special Aryan reason. As now, in Aryan alone of all Indo-European languages (including Hittite), the vocalic laryngeal is palatalized, and materializes as an *i*, it seems very likely that we have here the special reason for the transition *e > a*, which thus would be a differentiation against the overwhelming tendency towards palatalization.

To justify this view we may cite a parallel from Teutonic.

In post-Gothic Teutonic we have a far-reaching palatalization of vowels under the influence of an *i/ī* in the following syllable, the well-known *i*-mutation. Most widely spread is the transition of *a* to *e*. During this development the new mutation *e* (*e*) must come close to the inherited *e* (*ē*). In fact, the two *e*-sounds have fused in most Teutonic languages: in Icelandic and Scandinavian, in Frisian and English, in Low German and Dutch. Naturally, there may be cases where the combinatory conditions are averse to palatalization and where thus the mutation does not go further than to an open [ɛ], e. g. OE *æspe* (< **aspiō*) 'asp' as against OE *helpan* with *ē*. And inversely, there are cases where the combinatory conditions are so favourable to palatalization that this does not stop at *e* but goes further to *i*, e. g. Eng. *chill*, Dutch *kil* (< **kaldīa-*). Sometimes the in-

herited \bar{e} stood in positions parallel to those provoking the transition $a > e$, and then, in a very ancient period, \bar{e} was changed into i , e. g. OE, OS *is*, OHG *ist* (< **esti*), OHG *nimīt* (< **nemedī*) 'takes', OHG *gibirgi* (< **gabergia-*). But the same transition $\bar{e} > i$ is found under different conditions at an early stage in several Teutonic languages, thus in pre-German before an u in the following syllable: OHG *sibun*, OS *sibun* (but OE *seofon*) '7', OHG *sichur* < Lat. *sēcūrus*; in Old English before h -combinations: *six* (Goth. *saihs*), *cniht* (OHG *kneht*); in most cases before nasal combinations: OS *kind*, OHG *chint* 'child' (cp. Lat. *gens*), OI *fimm*, OHG *fimf* '5' (Gk πέντε); in Gothic \bar{e} is generally changed into i . Sometimes also the opposite development is found: in Old High German i has often become \bar{e} before an a , e , or o in the following syllable: *wēhha* 'week' (OS *wika*), *lēbēn* 'to live', *lēcchōn* 'to lick' (OS *liccon*). All this goes to show that in primitive Teutonic the inherited \bar{e} cannot have been a very open, but must have been a rather close e -sound.

But then the question arises, how we may account for the fact that there is in Middle High German (and later German) a clear distinction between the inherited \bar{e} as an open and the new mutation- e as a close sound, e. g. open e in *lēben* 'to live', *stēln* 'to steal', *lēsen* 'to read', but close e in *hēben* 'to lift' (< **habbiān*), *zēln* 'to tell, number' (< **tal(l)īan*), *rēde* 'talk, poem' (< **rapīō*). Whereas in standard pronunciation of Modern German the two sounds are not kept apart, in many parts of South Germany even educated people still pronounce *leben* and *stehlen*, etc., with an open e -sound, but *heben* and *zählen*, etc., with a close e ; in dialects \bar{e} may even develop into an a .

This must be due to a differentiation in Old High German. When the mutation of a reached the stage of a close e , there arose the danger of confusion with the inherited \bar{e} . Now, the new e could not escape, because it was still under the palatalizing influence of the following syllable (e. g. OHG *grēbit* 'digs', *gēsti* 'guests', *mēnnisc* 'human', *bēzziro* 'better'), but the inherited \bar{e} , which was never preserved before an i/\bar{i} in the following syllable, could and did escape fusion, receding into a more open sound. In the great majority of cases High German—alone of all Teutonic languages—has worked out this distinction between the mutation- e and the inherited \bar{e} , that the former remains

a close *e*-sound, but the latter becomes an open *e*-sound, in dialects even an *a*.

In the same way, now, we may understand the Aryan development. When the laryngeal *H* was palatalized—as so many other sounds of primitive Aryan—the vocalic form, *H̥*, which originally had the same *a*-timbre as in the other IE languages, must have come close to the inherited IE *e*-sound. It thereby pushed this *e* into a more open position—finally *a*—while the *H̥* itself went on being palatalized, till the final stage was reached, viz. *i*.

If we ask why no resistance was afforded by the older Aryan *a* (representing *o* and *a* of other IE languages), the answer probably must be that in Aryan qualitative apophony (with the vital distinction between *e* and *o* (Aryan *a*)) had been superseded by quantitative apophony: Aryan does not only preserve the *guṇa*-grade, but develops the *vrddhi*-grade richly. The qualitative distinction between *e* and *a* had thus lost much of its significance. Another reason is that when the velars *k*, etc., are changed into the palatals *c*, etc., before *e*, but preserved as *k*, etc., before *a*, then the distinction *e/a* is kept up clearly enough in the initial consonant, and thus is superfluous in the vowel. So the push of the palatalized laryngeal vowel meets no sufficient resistance.

§ 19. Indo-European $g^h/Hu > hu-$, $\hat{k}/\hat{g} < h$ in Hittite.

Whereas the Centum-languages, in favouring labialization, repel palatalization and the Satəm-languages, in repelling labialization, favour palatalization, an original feature of Hittite seems to be aversion to and neglect of laryngeal articulation. If we are right in assuming Indo-European *H* to have been a voiced laryngeal fricative, Hittite *h*, being a voiceless velar fricative, shows not only replacing of laryngeal through velar articulation, but even neglect of the original voicing—which is also a laryngeal articulation—since the previous stage of development, the voiced fricative, has been given up.

It is interesting that the same abandonment of the voicing of a velar fricative seems to have taken place in one case more.

It is well-known that Hittite *ḥ* is not merely the representative of IE *h*; the sound *ḥ* occurs in many loan-words, and it sometimes originates in an IE velar sound. HANS HENDRIKSEN¹ has pointed to the fact that IE *k^u* and *gh^u*, both at the beginning of the word and in the middle of the word, *g^u* in the middle of the word, are represented by Hittite *ku* (i. e. *ku/ku*): *ku-iš* 'who' (Lat. *quis*), *ku-en-zi* 'beats' (Gk *ῥεῖνω*, Skr. *hāntī*), *ne-ku-ma-an-za* 'naked' (Goth. *naqaps*); but *g^u* is at the beginning of the word, in four instances and with no counterinstances, *ḥu-*: *ḥu-el-pi-iš* 'young animal' (Gk *δελφύς*, Skr. *gārbha-*: IE **g^uelbh-*; Pre-Teutonic **k^uelb-* (Dan. *hvalp*, Eng. *whelp*, Germ. *welf*), is somehow a deformation), *ḥu-u-i-tar* 'animal' (Gk *βίος*, Skr. *jīvā-*), *ḥu-wa-a-i* 'runs, marches' (Gk *ἔβη*, Skr. *āgāt*), *ḥu-ul-la-a-i* 'smites, destroys' (Gk *βάλλει*). By this special development of *g^u-* (while *g* is generally preserved as an occlusive in Hittite) we are perhaps reminded of such cases as *gh^u* > *g^u* > *u* in Teutonic (cp. OHG *warm*, Lat. *formus*, Gk *ῥερμός*) as against *gh* > *g* (> *g*) in other cases. But the decisive fact is that the intermediate stage between IE *g* and Hitt. *ḥ* must here, in the combination IE *g^u* > Hitt. *ḥu-*, be the voiced velar fricative—exactly as this sound must lie between IE *h* and Hitt. *ḥ*.

We saw that Indo-European displayed *h* before all sonants, whereas Hittite preserved only *ḥu*, in the form of *ḥu-* and with *g^u* as previous stage. We now understand this better in realising that, in Pre-Hittite, *g^u* had arisen in another way, too, viz. from IE *g^u-*.

Moreover, the neglect of laryngeal articulation discernable in the history of Hitt. *ḥu-*, is seen in all Hittite occlusives: in Hittite writing the available signs for tenues and mediae are used, if not at random, at least without any consistent rule, that is to say with indistinct observation of a dwindling sound distinction, or perhaps with an obscure memory of a former distinction. Just as Pre-Hittite or early Hittite *g* changed to *ḥ*, Pre-Hittite (Indo-European) or early Hittite *b*, *d*, and—in most cases—*g* must have become Hittite *p*, *t*, *k*, or at least have come near to these sounds.—Furthermore, Hittite writing had no characters for aspirates, but seemingly these sounds, too, had become tenues.

There is one further remarkable case of Hittite *ḥ* originating in an IE velar sound.

HOLGER PEDERSEN² has pointed to instances where *ḥ* must come from a palatalized *k/g* (“*kj/gj*”). He assumes (1) that *k/g* was palatalized before front vowels, (2) that the palatalization was carried before an *a* when—as often in Hittite—an *e* was changed into an *a*, (3) that the “*kja/gja*” which had thus arisen developed into *ḥa*, but (4) that the palatalization was lost before the homorganic front vowels (cp. e. g. *gi-e-nu* ‘knee’, *ki-eš-šar* ‘hand’).

Now, it is curious that all words displaying, with any probability, this development of “palatalized” *k/g* into *ḥ* seem to have IE palatovelar *k̄/ḡ*, as will be seen in the following list of words hitherto adduced:

ḥa-ar-aš-ni or *ḥar-ša-ni* / *ḥarsni* /, loc., ‘head’ < **korhsn-* (with regular loss of *H* in the consonant combination), cp. Ion. κόρση ‘temple of the head’, Gk κέρας ‘horn’ < **kerhs*, Skr. *śiraḥ* / *śirśan-* ‘head’, gen. *śirṣṇāḥ* < **k̄hhrs-* < **k̄ḥhs-* (-*ir-* < -*rH-* as in *sīrṇā-*, etc., above p. 35).

ḥal-ki-iš ‘corn’ < **ḡolki-*; cp. O.Slav. *zlakū* < **ḡolko-* ‘grass’, Phryg. ζέλκια λάχανα < **ḡelkiā*.

ḥa-a-li-ja ‘kneels, bows down’ < **k̄oli-*, cp. Lith. *šalis* ‘side’ < **k̄oli-*, Goth. *halps* ‘inclined’ (*wilja-halpei* ‘inclination’), OHG *hald* ‘inclined’ < **kol-*; cp. Goth. *hulps*, OHG *hold* id. < **k̄l̥-*. Better known is the root form **klei*: *kli* in Skr. *śráyāmi*, Gk κλίνω, Lat. *clīno*, Lith. *šliejù* ‘recline’, etc. (Holger Pedersen combines the Hittite word with Lith. *kēlias* ‘knee’, but is ‘knee’ the original meaning of this isolated word?).

ḥal-za-a-i ‘recites, prays, calls’ < **ḡal-* as a probable variety besides **ḡar-* / **ḡal-* in onomatopoeic words meaning ‘call, cry, babble’, etc., like Lat. *garriō* ‘talk, babble’, O.Ir. *gáir* ‘cry’, Arm. *cicairn* ‘swallow, hirundo’, Ossetic *zarj̄n* ‘sing’—Cymr. *galw* ‘to call’, OI *kalla* ‘sing, call’, OE *callian* ‘call’ (Holger Pedersen with doubt to Gk καλέω or κέλομαι).

ḥa-an-na-a-i ‘judges, decides a law suit’ < **k̄onH-* with the *o*-grade of Goth. *kann* ‘can’, *gakannjan* ‘make known’; Teut. *-nn-* perhaps < *-nH-* as in *kinnus*, p. 37 (Holger Pedersen: *e*-grade of Lith. *žénklas*).

ḥa-an-ša-tar ‘family, descendants’ < **k̄onHī-* with the *o*-grade

of Gk γόνος 'descendance' (Hans Hendriksen, who has adduced this word, starts from the *e*-grade).

In the middle of the word, till now only one instance has been found: /weh/ 'turn, versari', /wehzi/, 3. sg., /waḥanzi/, 3. pl., /weḥun/, 1. sg. prt., /waḥanza/, part., wa-ḥa-an-du, 3. pl. imper. act., ú-e-ḥa-an-ta-ri, 3. pl. med.; cp. Goth. *gawigan* 'move', Lat. *vehō*, Lith. *vežù*; IE **ueǵh*. As Holger Pedersen points out, forms with other sounds after *h* than back vowels must be analogical.³—An inverse analogy we find in the word for 'knee': *gi-e-nu* /*genu*/, nom., and /*kinuwas*/, dat. pl., but /*ganut*/, instr.; here the occlusive before the *a* of /*ganut*/ must be analogical.

Outside the series I should place *ḥar-aš-zi* /*ḥarsti*/ 'ploughs', which can hardly be identified with Skr. *kárṣati* id. (as Holger Pedersen proposes), because the Indian word does not presuppose IE *ke*—which would be necessary for the identification—but *ko*-/*ka*-. Moreover, the comparison of Skr. *kárṣati* or *kṛṣáti* with Hitt. /*karsmi*/ 'I cut' (Gk κείρω, OI *skera*; Holger Pedersen, Hitt. p. 95) lies closer at hand. Hitt. *ḥars*-, on the other hand, might conveniently be combined with Lat. *arāre*, Goth. *arjan*, etc., 'to plough': IE **harhí*-; cp. p. 26.

Certainly, more words parallel to *ḥar-ša-ni*, etc., might be adduced; but I think that those mentioned here would perhaps justify the following alteration of the hypothesis of HOLGER PEDERSEN: Indo-European palatovelar *k̄/ḡ* developed into Hittite *ḥ* before a back vowel, but lost (or reduced?) the palatal element before a front vowel.

The phonetic explanation is like the one given by Holger Pedersen. A parallel may be cited from Modern Danish. Formerly the consonants *k* and *g* were palatalized before front vowels, which is still indicated in archaic writing: *igjen* 'again', *gjøre* 'make, do', *kjende* 'know', *kjær* 'dear', now spelt *igen*, *gøre*, *kende*, *kær*; in names we may still find such instances as *Kjøbenhavn* besides *København*, *Gjentoft* besides *Gentofte*, but the *-j-* is never pronounced, the palatalization has disappeared before the homorganic front vowels (differentiation). In the position before back vowels, however, the palatal element is preserved both in writing and in pronunciation: *gjorde* [g̊jɔʁə], prt. of *gøre*, *skjold* 'shield', *kjole* 'dress', *gjælde* 'sound loudly', *skjule*

'hide'. (In Danish dialects and in Swedish and Norwegian the palatalization has been preserved even before front vowels).

In Hittite the IE palatovelars would have lost or strongly reduced the palatalization before front vowels, appearing here perhaps as pure velars; the development in the position before consonant is as yet unknown; before back vowels the palatovelars would have preserved the palatalization, with the fricative *h* as result. It is possible that *k̄* became first the palatovelar fricative, known as the *ich*-sound of Modern German. But it is not in the least astonishing, if the *ich*-sound did not keep apart from the *ach*-sound of *h* which had arisen out of IE *g* (in *g^h*-) or, in many cases, IE *h*: phonemic and even phonetical fusion of the *ich*- and *ach*-sound takes place in many languages.—Since *k̄* and *ḡ* both become *h*, we have here, too, the neglect of laryngeal articulation so characteristic of Hittite.

However, this assumption of Hitt. *h* having sometimes originated in a Pre-Hittite palatovelar, has to be carefully examined because of its far-reaching consequences. If we must acknowledge that Hittite besides labiovelars (*ku-iš*, *ku-en-zi*, *ne-ku-ma-an-za*) did possess or presuppose palatovelars (*ḫar-ša-ni*, *ḫal-ki-iš*, *ú-e-ḫa-an-ta-ri*, etc.) then Hittite is neither a Centum- nor a Satəm-language. Centum-languages have labiovelars but no palatovelars; Satəm-languages have palatovelars but no labiovelars. Hittite, with both labiovelars and palatovelars, must thus have derived from the common Indo-European stock, before the division into Centum- and Satəm-languages took place.

§ 20. Summary and Final Remarks.

A result of our investigations is the assumption that the Indo-European laryngeal phoneme was approximately a voiced *h* (*h̄*). In Pre-Hittite and cognate "Anatolian" languages the voiced laryngeal fricative developed into a voiced velar fricative, which was unvoiced in Hittite—as were other voiced consonants—and became here the voiceless velar fricative *h*. In the other IE languages *h̄* was primarily preserved as such.

The Indo-European laryngeal phoneme was found initially before a vowel: Hittite has some words beginning with vowels,

and some words beginning with *h* + vowel. In the other IE languages (the Centum-Satəm-languages), initial vowel and initial laryngeal vowel fused, in most languages—at any rate Satəm—into initial vowel (which goes to say that the initial laryngeal was here lost in antevocalic position); but in some languages (Centum?) initial vowel and initial laryngeal + vowel merged into initial laryngeal + vowel, thus at any rate in Greek and Teutonic. Greek simply preserves the IE laryngeal (the voiced *h̥*) as spiritus lenis in opposition to the spiritus asper (voiceless *h*); the same is probable in Teutonic. Only in the position before *u*, the laryngeal, in some western languages, was not maintained as a consonant, but was vocalized (*h̥* > *a*), IE *h̥u-* becoming thus in Hittite *hu-*, in some eastern languages *u-*, in some western languages *au-*. In Greek the consequence is that initial *u-* does not accept the spiritus lenis, but fuses with *hu-* into this sound combination: Greek has no initial *h̥-*, only *h̥-* (and no prothetic *u*). In the later development of such languages as Greek and Teutonic the laryngeal has no function and is thus lost as a phoneme. The early loss of the originally voiced Italic *h* (< IE *gh*) may perhaps be due to fusion with the IE *h̥*.

The Indo-European laryngeal phoneme was found before each of the other sonants (*i*, *u*, *r*, *l*, *m*, *n*). In Hittite laryngeal + *u-* (*h̥u-*) is directly attested as *hu-* (this sound combination had arisen in another manner, too, viz. from IE *gh̥u-*), and *hu-* is distinct from *u-* < IE *u-*. In Greek *h̥u-* is reflected as prothetic vowel before digamma, and is distinct from the simple digamma (< IE *u-*): the prothetic vowels of Greek (α-, ε-, ο-, ι-) represent a secondary vocalization of the IE laryngeal consonant. In Celtic and Armenian *h̥u-* and *u-* fuse into *h̥u-* (this development being responsible for the Celtic and Armenian loss of *p*-). In all other IE languages *h̥u-* and *u-* merge into *u-*.

In the position before *l*, *m*, *n* (thus in the combinations *h̥l*-, *h̥m*-, *h̥n*-) the laryngeal is in Greek reflected as prothetic vowel before these sounds (which is in accordance with the Greek development before *u-*); the same is, to a certain extent, seen in Armenian. In Greek, furthermore, IE pure *l*-, *m*-, *n*- and Greek *hl*-, *hm*-, *hn*- have fused into *l*-, *m*-, *n*-. In the position before *r*- the laryngeal is in Greek (and Armenian) likewise reflected as prothetic vowel before *r*-, but in Greek laryngeal +

r- and pure *r-* have fused into laryngeal + *r-*, whereas Greek *hr-* is maintained as $\acute{\rho}$ -: IE words with initial *r-* in Greek generally have prothetic vowel before ρ , no Greek word begins with pure ρ -, all Greek words with initial $\acute{\rho}$ - have the spiritus asper.—In all other IE languages (including Hittite) laryngeal + *l-*, *m-*, *n-*, *r-* and pure *l-*, *m-*, *n-*, *r-* have fused into pure *l-*, *m-*, *n-*, *r-*.

In the combination $\acute{h}i$ there is a tendency towards assimilating the group into an emphatic palatal \acute{z} or $d\acute{z}$. The product of assimilation $d\acute{z}$ - is—according to the rules of Greek phonology—reflected as \acute{z} - in Greek, whereas IE pure *i-* is generally represented by *h* (the spiritus asper). In the middle of the word $\acute{h}i$ > \acute{z} - seems to occur in Hittite—of course in the unvoiced form \acute{s} -. The \acute{s} fused with IE $d\acute{i}$ - and with the inherited sibilant-phoneme *s*; this accounts for the Hittite use of \acute{s} -signs for the IE sibilant.—The combinations $(-)g\acute{h}i$ -, $(-)g^u\acute{h}i$ -, $(-)k\acute{h}i$ - are reflected in Greek as $\chi\acute{\sigma}$, $\phi\acute{\sigma}$, $\kappa\tau$, in the other IE languages mostly as palatal or dental sibilants or as combinations containing these sounds. We may understand the phonological processes leading to these results when starting from \acute{z} or $d\acute{z}$ as a product of assimilation of $\acute{h}i$ -. Apart from these cases IE $\acute{h}i$ and *i* have fused, generally into *i*, sometimes into $\acute{h}i$. (It is not excluded that in Celtic and Teutonic the result of the fusion was sometimes $\acute{h}i$ (cf. $\acute{h}u$ -/*u*- > Celtic $\acute{h}u$ -!): this assumption might account for the not infrequent loss of initial *i-* and $\acute{h}i$ - in these languages, since \acute{i} - is lost in initial clusters both in Celtic and Teutonic).

The Indo-European laryngeal phoneme was found in the position after a vowel. In Hittite the \acute{h} , which had developed out of IE \acute{h} , was maintained before some consonants, lost without trace before others. In the Centum-Satəm-languages the \acute{h} was primarily retained in postvocalic position, but during the development of the single languages it was lost in lengthening the preceding vowel.—The Indo-European laryngeal consonant was in most cases lost without a trace in postconsonantal position, but there are exceptions, especially after a velar, sometimes after other occlusives, too, in Hittite after *s* in the middle of the word. These two rather well-known aspects of the IE laryngeal are not treated at length in this paper.

Finally, the Indo-European laryngeal phoneme may—precisely as the other sonants—become the centre of the syllable, be vocal-

ized. The vowel fi appears as an a of a special quality (a^2): through a development peculiar to Indo-Iranian, a^2 mostly becomes i in this language.

In comparing this article with former works on the Indo-European laryngeals, the rather narrow scope of the present study is evident. It is not here pretended to say anything on the origin of the Indo-European laryngeal, nor on the nature, development, and effect of Pre-Indo-European laryngeals. In my opinion there can hardly be any doubt as to the fruitful field of research, still open here, with the possibility of deriving benefit from the sagacious work hitherto accomplished by many scholars. But it may be reasonably doubted whether Indo-European knew more than one laryngeal phoneme, and then it is—as was said in the beginning—our right and duty to make investigations on the basis of the working hypothesis of one Indo-European laryngeal.

This is what we have done. We have tried to make out some of the conditions and effects of the laryngeal phoneme, once present in the Indo-European mother tongue, and in several cases probably surviving till well into the independent life of the separate Indo-European languages. We have tried to see old, well-known difficulties of Indo-European phonology in the new light placed at our disposal through the important studies of recent years on Hittite.

I hope that it will be agreed that some elucidation has been gained through the working hypothesis here followed.

It is evident that this study is by no means exhaustive. Wider and deeper research as to the Indo-European laryngeal will have to be made. And it stands to reason that this may be a useful basis of still more extended studies of Pre-Indo-European laryngeals, of Indo-European phonology in general, and perhaps of the outward relations of Indo-European.

*Drafted in halcyon days in Utrecht, March—July 1947,
completed in Copenhagen.*

Appendix.

Remarks on the Hittite words
šiwats 'day', *šiuṇaš* / *šiwanniš* 'god', *šuppiš* 'sacrosanct'.

It has been shown above p. 26 f. that it seems possible to refer these words to the root form **dīēu- : dīu-* 'light, heavenly light, divinity', which we know from Skr. *Dyáuḥ*, Gk *Ζεύς*, Lat. *Diēspiter*, etc., (*DINGIR-uš* (EHELOLF, p. 179) may even directly represent *šiuš* < **dīēus*), and that correspondingly *šiyari* 'appears' may derive from the root form **dīēi-*. Some supplementary remarks will not be superfluous.

The derivative *t* in *šiwat-* 'day' is known e. g. from Skr. *dyota-* 'shine, gleam, slime' < **dīēuto-* and the originally denominative verb *dyótate* 'shines'. The word *šiwanni-* 'god' ('lord of the light and the heaven') is in all probability derived from *šiwat-* 'the light part of the world—cp. Skr. *loká-*, OS *lioh!*—and of the time', i. e. 'the day', with *-nni* < *-tni*, cp. STURTEVANT, Hitt. Gr. § 71 and HOLGER PEDERSEN, Hitt. § 40, thus *šiwanni-* < **šiwatni-*. But it is not clear whether *šiuṇa-* has *-no* or *-tno*; both possibilities are open: cp. Gk *πελλός* 'blackish' < **pelno-* and *πελιτνός* 'livid' besides Skr. (*palitá-* —) *páliknī* < **pelitni* or **pelitni* (!). It is perhaps the most simple solution of the question to assume *t*-derivation in all three words: *šiwat-*, **šiwatni-* > *šiuṇa-*, **šiwatni-* > *šiwanni-*. In the trisyllabic *ši|wan|ni-* the gemination *n* < *tn* is preserved, in the dissyllabic *šiu|na-* this was not possible.

Which Indo-European vowel the *a* of *šiwat-* / *šiwanni-* represents is not clear. It may correspond to a Greek *o*: **dīēuot-* / **dīēuotni-* (cp. Gk *δεσπότης* / *δέσποινα*); then **dīēutno-* > *šiuṇa-* would display the zero-grade *-t-* of the derivative. Or it might be the vocalized laryngeal **dīēuht-* / **dīēuhtni-* (cp. Skr. *palitá-* / *páliknī*) with the corresponding consonantal laryngeal in **dīēuhtno-*; in this latter form the *h*—respectively the Pre-Hittite velar—must

disappear in the position before the occlusive, leaving **dīēutno-* > *šīuna-*.

In other Indo-European languages the zero-grade of this root (with the *u*-determinative) is very conspicuous. Before vowels it is *diu-*: (Gk Δίος, gen., Skr. *diváh*, gen., etc.), before consonants *dīu-*: cp. Skr. *dyu-* 'light, day, heaven' in such a derivation as *dyumná-* 'splendour, ability', or in compounds like *dyuniś-* 'day and night', *dyupati-* 'lord of the heaven or of the light', *dyupatha-* 'air' (*pathí-* 'path, way'), *dyumaṇi-* 'sun' (*maṇi-* 'jewel'), *dyuvadhū-* 'apsaras' (*vadhū-* 'woman'). Especially we find the zero-grade with the derivative *t* in the noun *dyút-/dyúti-* 'shine' and in verbal forms like *ádyutat*, aor., *didyuté*, perf. med.

Besides the long grade of the root form **dīēuot-/dīēut* or **dīēuht/*dīēu(u)t* we have a right to look for the zero-grade in Hittite; it is of no importance whether we start from **dīuut* or **dīut*: since Hittite *h* < IE *H* is lost before occlusives, the result in Hittite must be **šut*. I propose in this connection to adduce the adjective *šuppi-/šuppa-* 'sacrosanct, holy, clean, not under taboo' (see the forms: STURTEVANT, Hitt. Gr. 179 f.) It is true that HOLGER PEDERSEN, Hitt. 36 combines the word as **šu-bhuī* with Skr. *su-bhānu-* 'beautifully shining', but (1) this involves a rather violent reduction of the element with the sense of 'shining', (2) corresponding to Skr. *su-*, Gk εὖ-, Hittite has *aššuš* 'good', (3) it is not known if Skr. *subhānu-* originally belongs to any religious sphere. So I should prefer to take *šuppi-/šuppa-* as coming from **dīutbhi-/dīutbho-* with apophony to **dīēut*.

The derivative affix *-bh(o)/bhi(o)* is well-known in colour-adjectives (and in corresponding names of animals), e. g. Lat. *albus*, Gk ἄργυρος 'white', Polish *gołębi* 'blue', Russ. *golubój* 'light blue', Lat. *palumbis* 'dove'; BRUGMANN 2,1 § 283 ff.¹

As for the words *šīunaś*, *šīwanniś* in connection with *šiwaz* 'day' we remember that *n*-derivatives are very common with words designating colour, cp. e. g. Gk ὀφθαλμός 'dark', Lat. *cānus* 'grey', O.Ir. *bán* 'white', OHG *brân* 'brown', O.Sl. *vranū* 'black, raven', O.Sl. *zelenū* 'green'; Skr. *dyumná-* < **dyubhna-* has (1) *-bh-* as the old derivative for colour adjectives, and (2) *-na-* as the new one, still surviving in Indian (BRUGMANN 2,1 § 179). Some of these are in India names of gods or heroes: *Kṛṣṇá-* 'the Black One', *A'rjuna-* 'the White One'. And in the Indo-European languages

there are more names of divinities derived with an *n*, e. g. Skr. *Váruṇa-*, Lith. *Perkúnas*, O.Sl. *Perunŭ* (Alb. *peren-dí* 'heaven'), Osc. *esuno* 'divine' (perhaps Etruscan loanword), OE *Wéden* (OS *Wôdan*, OI *Óðinn*). Sometimes we have derivations with *nī/nī*: Skr. *Parjánya-*, OI *Fjörgynn*. To these we may now add the Hittite words *šūnaš/šiwanniš* with *šiu-* < **dīēu-*—the root form of *Ζεύς*—and with the *t*-derivative of Skr. *dyút-*, *dyótate*. The adjective *šuppīš* (with the zero-grade **dīut-*) belongs to *šūnaš/šiwanniš* much in the same way as Skr. *divyá-* 'divine' belongs to *devá-* 'god'.

When we take into account that the Hittite *i*-declination comprises *i*-stems, *io*-stems, and *iu*-stems, which latter were feminine in Indo-European (HOLGER PEDERSEN, Hitt. 35), we realize that the relation between *šūnaš* and *šiwanniš* may originally have been that of 'god' and 'goddess'; cp. OI *Fjörgynn*—*Fjörgyn*, *Freyr*—*Freyja*, etc. In connection with the loss of the feminine gender in Hittite (or Pre-Hittite), the sense of *šiwanniš* may have changed from 'goddess' to 'god'. A well-known parallel is that in early Teutonic times **nerþuz* (Tacitus: *Nerthus*) was a goddess: but since North Teutonic preserves only masculine *u*-stems, the corresponding OI *Njörðr* became the name of a god.²

Thus these Hittite words seem to fit well into the compass of Indo-European linguistic (and religious) facts and tendencies.

Notes.

I am much indebted to my colleague KAJ BARR, who has been kind enough to assist in reading the proofs and has given many corrections and valuable intimations. And I offer my thanks to NIELS HANSLUND for having revised my English, and to NIELS EGE who has assisted in preparing the Index of Words.

In this paper Indo-European, after the fashion of most linguists, designates our linguistic family and its mother language, thus deviating from EDGAR H. STURTEVANT and other American scholars who call the mother language Indo-Hittite, and the languages derived therefrom but not belonging to the Hittite branch, Indo-European.

ad § 1.

Bibliographies of the theory of Indo-European laryngeals are found in HANS HENDRIKSEN, *Untersuchungen über die Bedeutung des Hethitischen für die Laryngaltheorie* (Det Kgl. Danske Videnskabernes Selskabs Historisk-filologiske Meddelelser XXVIII, 2, Copenhagen 1941), 4, and EDGAR H. STURTEVANT, *The Indo-Hittite Laryngeals* (Baltimore 1942), § 1-10. Compare further: F. B. J. KUIPER, *Notes on Vedic Noun-Inflection* (Mededeelingen der Nederlandsche Akademie van Wetenschappen. Afdeling Letterkunde. Nieuwe Reeks. Deel 5, No. 4. Amsterdam 1942); id., *Vedic śadhīṣ- : sadhāsta-* and the Laryngeal Umlaut in Sanskrit (Acta Orientalia XX, Leiden 1946); id., *Traces of Laryngeals in Vedic Sanskrit* (India Antiqua, Leiden 1947, 198-212); and several articles in *Language*: 17 (1941), ROLAND G. KENT, *The Greek Aspirated Perfect*; 18 (1942), 22-25 WILLIAM M. AUSTIN, *Is Armenian an Anatolian Language?* (refuted *ibidem* 226-8 by KERNS and SCHWARTZ); 19 (1943), 83-124 FRANKLIN EDGERTON, *The Indo-European Semivowels*; 165-8 ROLAND G. KENT reviews Sturtevant's *Laryngeals*; 293-312 EDGAR H. STURTEVANT, *The Indo-European Reduced Vowel of the e-series*; 20 (1944), 88 EDWARD H. SEHRT, *Notes on Sturtevant's Indo-Hittite Laryngeals*; 23 (1947), 1-22 THEODORO MAURER, *Unity of the Indo-European Ablaut System, the Disyllabic Roots*; finally BENJAMIN SCHWARTZ, *The Root and its Modification in Primitive Indo-European* (*Language*, 23, No. 1. Supplement. January-March 1947).

I am glad to acknowledge special benefits from the following studies: HERMAN MÖLLER, *Die semitisch-vorindogermanischen laryngalen Konsonanten* (Det Kgl. Danske Videnskabernes Selskabs Skrifter, 7. Række, hi-

storisk og filosofisk Afdeling IV, 1, Copenhagen 1917): it is tragical that the last work of Herman Möller—to whom as my teacher and predecessor at the University of Copenhagen I shall always be grateful—should appear on the eve of the Hittite discovery; HOLGER PEDERSEN, *Hittitisch und die anderen indoeuropäischen Sprachen* (Det Kgl. Danske Videnskabernes Selskabs Historisk-filologiske Meddelelser XXV, 2, Copenhagen 1938): in § 107 Holger Pedersen summarizes his theory of Indo-European laryngeals; HOLGER PEDERSEN, *Lykisch und Hittitisch* (ib. XXX, 4), Copenhagen 1945; E. BENVENISTE, *Origines de la formation des noms en Indo-Européen*, I, Paris 1935: Chap. IX, *Esquisse d'une théorie de la racine*; JERZY KURYŁOWICZ, *Études indo-européennes*, I, Kraków 1935: here Kuryłowicz summarizes, corrects, and extends his earlier important studies on the subject; finally the above named books by HANS HENDRIKSEN and EDGAR H. STURTEVANT.

¹ KURYŁOWICZ, p. 43; cp. HANS HENDRIKSEN, p. 51.

² HANS HENDRIKSEN, p. 89.

³ HOLGER PEDERSEN, *Hittitisch* p. 10.

ad § 2

The facts here mentioned can easily be found in the usual manuals of Teutonic languages.

¹ The voiceless velar spirant of Hittite is certainly a younger phase of evolution than the voiced velar spirant of Lycian; cp. note 3 to § 13 and the whole of § 19.

ad § 3

The common handbooks have naturally been consulted. BRUGMANN-DELBRÜCK, *Grundriss*²; HIRT, *Indogermanische Grammatik*; the etymological dictionaries (I think, I have looked up the opinion of WALDE-POKORNY on every word which I have dealt with, but I have refrained from polemics, because Walde-Pokorny do not take any laryngeal into account). As for Greek and Latin I have especially used MEILLET-VENDRYES, *Grammaire des langues classiques*, Paris 1924; and EDUARD SCHWYZER, *Griechische Grammatik*, I, München 1939; as for Hittite—besides the works named in the note to § 1—STURTEVANT'S *Comparative Grammar of the Hittite Language* (Philadelphia 1933), and his *Glossary* (², Philadelphia 1936), and especially, J. FRIEDRICH, *Hethitisches Elementarbuch*, Heidelberg 1940. If Hittite words are given in full transcription, a simplified form is often added between oblique strokes; simplified forms are generally taken from Sturtevant.

¹ IE **h₂eh₂nt-* regularly becomes **u₂ēnt-* in Pre-Italic and Pre-Teutonic, whence normally Lat. *ventus*, Goth. *winds*. In Hittite the laryngeal (or its successor, *h*) is retained before *u*, and between vowel and *u*, *l*, *š*, but lost between vowel and occlusive; no instances are known with *h* between vowel and *n* or *m*, even if there are many endings with these

consonants, and so in all probability the *h* was lost in this position, too. The resulting **huent-* becomes regularly *huant-*, since *e* becomes *a* before *nt*; cp. *an-du* 'in' and Lat. *endo*, *ši-pa-an-ti* 'libates' and Gk σπένδω (but before *nk* and *nz* Hittite retains *e*). Thus the stem of Hitt. /*hwantes*/ may simply be identical with that of Lat. *ventus* and of Goth. *winds*.

Cp. on *h* in the position between vowel and consonant HENDRIKSEN 59 (*h* before nasal is not mentioned); on *e > a* HOLGER PEDERSEN, Hitt. 106 (where *e* in the frequent forms with *-enz-* is held to be analogical; in fact, no sure instance of *enz > anz* has been adduced).—Deviating opinions on /*hwantes*/ of KURYŁOWICZ, *Études* 74 f.; STURTEVANT, Hitt. Gr. 97 HENDRIKSEN 50.

² STURTEVANT (Hitt. Gr. 75 footnote) without necessity doubts this etymology, cp. HOLGER PEDERSEN, Hittitisch 36 on the writing of double occlusive for earlier occlusive + laryngeal.

ad § 4

Cp. especially A. MEILLET, *Esquisse d'une grammaire comparée de l'Arménien classique*², Vienne 1936; HOLGER PEDERSEN, *Les pronoms démonstratifs de l'ancien arménien* (Det Kgl. Danske Videnskabernes Selskabs Skrifter, 6. R., hist.-filos. Afd. VI, 2, Copenhagen 1905) and his two studies in Kuhn's *Zeitschrift* Vol. 38 and 39 (e. g. 38, 206 and 39, 424 on Arm. *anicanem*, here on p. 7).

¹ cp. BENVENISTE 157 on ἀμέω.

ad § 6

KURYŁOWICZ (*Études* I, 43) "fait abstraction de tous les exemples à voyelle *r* initial, la voyelle prothétique étant obligatoire devant toutes les *r* initiales indo-européennes"; it may be asked why this is so.

¹ HOLGER PEDERSEN, KZ 39, 344.

² Sometimes we might be inclined to think that a vocalization of the laryngeal attracts the accent in Greek: ἄησι, ἄεσα, ἄεθλος, ἄεθλον, ὄνομα, ὄνειαρ, ἔλεος, ἄλεισον, ἔρεβος. Cp. Skr. *duhitár-*, but Gk θυγάτηρ (and Skr. *usrá-*, but Gk αὔριον § 13). A counterinstance is ἀνήρ. In such cases as ἔλαφρός, ἔλαχύς, ἀλοιτός the accent is typological.—The question would deserve further investigation.

ad § 7

I shall not discuss earlier explanations of Gk ζ- corresponding to *i*- in the other Indo-European languages (cp. SCHWYZER, p. 330), since none has been generally accepted, and since their authors could not derive benefit from the recent investigations into Indo-European laryngeals in Hittite. What is stated about IE *i* in Greek, is well-known facts; the examples are mostly borrowed from MEILLET-VENDRYES. STURTEVANT, *Laryngeals* § 74 c, assumes *i > h* to have originated in *ʔi* (with the more than doubtful laryngeal *ʔ*) and *i > ζ* to represent pure *i*.

¹ The Indo-European roots of the words mentioned would accordingly be: **h₁ieṷ-* (ἄϊαί, Skr. *yáva-*); **h₁ieṷg-*: *h₁iug-* (ἄϋγνυμι, Skr. *yunájmī*, जुग्यόν, Hitt. *yukan*, Skr. *yugám*, Lat. *jugum*, Goth. *juk*, OI *ok*, etc.); **h₁ies-* (ἄἴω, Skr. *yásyati*, OHG *jesan*); **h₁io²lis-* (ἄώνη, ζωστός, Lith. *júostas*); **h₁iu(fi)s-* (ἄῦμη, Skr. *yūśán-*, Lat. *jūs*).

² BRUGMANN-DELBRÜCK² I § 922—933; HIRT, Idg. Gramm. I § 226; HIRT-ARNTZ, Die Hauptprobleme der idg. Sprachwissenschaft (Halle 1939).

ad § 8

¹ KURYŁOWICZ, Études I, 46—55.

² Cp. on Gāthic Avestan *duǰdar* KUIPER, Notes 2 i; on Hitt. *u-uk* STURTEVANT, Hitt. Gr. § 227; on Hitt. *it* HOLGER PEDERSEN, Hitt. 99; on *egō-ik-ahám* KENT (Language 19, 168); Skr. *hānu-* = Gk γένυς remains obscure; a suggestion is made on p. 37.

Vacillation between consonantal and vocalic laryngeal is frequent and is evident e. g. in cases as Skr. *jānman-*/*jāniman-* 'birth' < **ǵen̥men-*/*ǵenymen-*. The compromise *ny* (consonantal + vocalic laryngeal, as in *duhitár-*) is probably seen in *prathimán-* 'breadth', *prthiví* 'earth', etc., and the compromise *ḡn* (vocalic + consonantal laryngeal) may account for *páriman-* 'abundance' < **pel̥ḡmen-* besides *páriman-* < **pel̥ḡmen-* (cp. *jāniman-*, etc.). Tocharian *tkācar* may naturally have *ā* from *mācar*, but it might also represent the same compromise *ḡn* (vocalic + consonantal laryngeal): < **dhuǵunter-*. Cp. Language 23, 4 f. (MAURER; KUIPER, Traces 201).

ad § 9

¹ KAJ BARR prefers the following indication of the stages of the assumed sound development: **ǵh₁i* > **ǵhd̥z* > **ǵd̥zh* > **ǵɣ* > *χɣ*, and **ǵ^uh₁i* > **ǵ^uhd̥z* > **ǵ^ud̥zh* > **βɣ* > *φɣ*; perhaps he is right.

ad § 10

¹ *hyáh*, in Ṛgveda, still sometimes *híah*, e. g. 10, 55, 5; cp. E. V. ARNOLD, Vedic Metre (Cambridge 1905), chapter V.

² Arm. *kū-* > *š-*: HOLGER PEDERSEN, KZ 38, 197.

ad § 11

¹ Alb. *ari*; cp. BRUGMANN² I § 921, HOLGER PEDERSEN, KZ 36, 106.

² On the disappearance of *i* in Teutonic after initial consonant, cp. § 2, p. 4.

³ The explanation here given of the Celtic forms of *χɣών* coincides on the whole with that given by HOLGER PEDERSEN, Vgl. Keltische Grammatik, I 69 ff. (supposition of a form with *-oi-*); the same is true as to the words for 'yesterday' and 'bear': ib. I, 89. This applies to the corresponding Italic words, too. Cp. also the more recent study by VENDRYES, Revue Celtique 40, 437 ff.

⁴ If Tocharian A *som* B *šaumō* 'man' is rightly compared with *χɣόνιος* (MEILLET, Journal asiatique 1912, I, 113; FEIST, Vgl. Wb. d. got. Sprache,

s. v.; HOLGER PEDERSEN, *Tocharisch*, p. 108), it seems difficult to combine Hitt. *tegan*, Toch. A *tkan* B *ken* 'earth' with χθών, too (HOLGER PEDERSEN, *ib.* 219; SCHWYZER, p. 326); as for *tegan*, etc., a combination with the root **tek* in Gk τικτω might be possible.

ad § 12

¹ In one case at least a difference between the inherited dental and the new palatal sibilant is discernible. In the position before a vowel IE *ns* became Hitt. [nts], written *nz*, e. g. *an-za-aš* 'us' (< **ans-* < *ns-*; cp. Goth. *uns(is)*); but to this rule *ha-an-ša-tar* 'family, descendants' is an exception which has not been satisfactorily explained (STURTEVANT, Hitt. Gramm. § 133; H. HENDRIKSEN 57). It is evident that at the time when the rule *ns* > *nts* was effective, the inherited IE sibilant was a dental, whereas the sibilant of *ha-an-ša-tar* (< *nī-*) was no dental, but a palatal.—We have a parallel in German phonology.

In the OHG and MHG periods the High German language possessed a pure dental sibilant [s] which was written *z(z)* and is derived from an ancient *t* in the position between vowels or—at the end of the word—after a vowel: OHG *ezzan*, MHG *ezzen* (OE *etan* 'to eat'), OHG MHG *daʒ* (OE *þæt* 'that'). If, through the loss of an intermediate vowel, an *n* (or another dental sonant) happens to occupy the position before this dental sibilant, we observe, in Modern High German, the development [ns] > [nts], etc., thus an intrusion of a homorganic occlusive between the dental sonant and the dental sibilant, e. g. (Lat. *monēta*) OHG *munīza*, MHG *mūneze* with [-nəs-], but after the loss of [ə] Modern High German has *münze* with [-nts-]; correspondingly MHG *einezec* with [-nəs-] becomes Mod.HG *einzig* with [-nts-]; *pīlz* < *būlez*, *Hirz(feld)* < *hirez*, etc.—In the same Old High German and Middle High German periods the High German language possessed a palatal sibilant, which was the inherited Teutonic (and Indo-European) sibilant, written *s*, but pronounced [ʃ] (as still in German in cases like *spāt*, *stehen*, etc.). When *n* or another dental sonant occupied the position before this palatal sibilant, there was no intrusion of a *t*. MHG *gans* was pronounced [ganʃ], and MHG *hals* was pronounced [halʃ]; when later the inherited sibilant, written *s*, in most cases relapsed into the dental articulation, the rule [ns] > [nts], [ls] > [lts], ([rs] > [rts]) was no more effective: in Modern High German *gans* is pronounced [gans], and *hals* is pronounced [hals] with the same dental articulation of the sibilant as in *münze* [müntsə], but without intrusion of a *t*. Cp. *Zeitschrift für deutsche Philologie* 57 (1932), 77—79.

The case of German *münze* with [nts] < [ns] as against *gans* with [ns] < [nʃ] is a rather close parallel to Hitt. */antsas/ an-za-aš* with [nts] < [ns] as against */hans(a)tar/ ha-an-ša-tar* with [ns] < [nʃ].

² ALBRECHT GÖTZE and HOLGER PEDERSEN, *Muršilis Sprachlähmung* (Det Kgl. Danske Videnskabernes Selskabs Historisk-filologiske Meddelelser XXI, 1, Copenhagen 1934), 72 f.; *Zeitschrift für Assyriologie* NF 9 (1936), 170—181 (H. EHLEOLF); *Revue hittite et asianique* 4 (1937), 104 f.

(P. MERIGGI); HOLGER PEDERSEN, *Hitt.*, p. 57 and 175; H. TH. BOSSERT, *Asia*, Istanbul 1946, 140 f. (against the form *dina* assumed by Meriggi) and 62 f. (on *-i-/-u-*, with bibliography); cp. W. COUVREUR, *De Hethitische h*, Louvain 1937.

³ Besides the suffix forms *-hlo/-hro* in such words as Gk ἀρίζηλος, δῆλος, Skr. *vācālā-*, *karmāra-*, Gk ἐρυθρός (< **urudhuro-*), σινδρός (< **σιν-ρος* < **σινηρος*), etc., we have with vocalic laryngeal *-hlo/-hro* in cases like Gk χθαμαλός, πέταλος, Skr. *ānīla-*, *rudhirā-* (< **urudhyro-*), Gk σιναρός, etc., BRUGMANN, *Grundriss* 2, 1, 355 and 365.

⁴ The Indo-European symbol *h/ð*: BRUGMANN-DELBRÜCK I § 919 ff.; it is interesting to note that not only HOLGER PEDERSEN, but also BRUGMANN in some cases supposed a *j*-sound as the basis of the *h*-combination; cp. SCHWYZER p. 325 and BENVENISTE in *Bulletin de la Société Linguistique de Paris* 38, 139—147.

ad § 13

¹ On spiritus lenis, cp. SCHWYZER 147; I = spiritus lenis is not found till Alexandrine times, but I = *h* was previously used in Tarentum.

² In this connection it is of no importance that some dialects have secondarily replaced the spiritus asper by the spiritus lenis, e. g. Lesbian ὤμεις.

³ KURYŁOWICZ, *Études* 74; insufficiently founded doubts by HANS HENDRIKSEN 29. With Hittite */huhhas/*, Lycian *xuga-* 'grandfather' I should identify the well-known (Lydian or Lycian) name Γύγης and compare Hesychios γυγάι πάμποι [= πάπποι]. In personal conversation KURT LATTE kindly corroborated that πάμποι must—as indeed hitherto assumed—be a corruption of πάπποι, and emphasized that a word from Minor Asia as lemma is quite in trend with what we expect to find in Hesychios. —According to HOLGER PEDERSEN (*Lykisch und Hittitisch* §§ 20. 42. 71) the voiced *-b-*, *-d-*, *-g-* of Lycian are due to a special development in this language; nevertheless, Hittite *h* presupposes a voiced [g] in Pre-Hittite, cp. here § 19, p. 54 f.

⁴ An instance of *uu > uu* in Albanese is perhaps *anē* 'ora, margo' < **ausnā* < **husnau*, if this belongs to **ouus* 'mouth' (Skr. *áh*, Lat. *os*, OI *óss*), cp. WALDE-POKORNY 1, 168, after G. MEYER, *Albanesisches Wörterbuch* 11.

⁵ Hitt. *huške-*—Lat. *aveo*, etc., cp. GÖTZE-PEDERSEN, *Muršilis Sprachlähmung* 51, and STURTEVANT, *Laryngeals* 41.

⁶ Cp. HOOPS, *Reallexikon der germanischen Altertumskunde* IV, 237; A. HEUSLER, *Deutsche Versgeschichte* 1 (1925) 95; R. HOLMERUS, *Studier öfver alliterationen i Eddan* (*Studier i Nordisk Filologi*, utg. R. PIPPING), Helsingfors 1936 (with bibliography). From the investigations by Holmerus and others it is evident, that the vowels of the alliterating syllables are not more frequently identical in case of vocalic than in case of consonantal alliteration, that therefore the theory, promoted by A. KOCK and others, of the vocalic alliteration having originated in alliteration of identical vowels, has no basis, that moreover the "vocalic" allitter-

ation was once of the same nature as the consonantal alliteration—i. e. that originally the alliterating vowels alliterated only through a (later lost) initial consonant. Nearly all authors on this secular problem (Holmerus included) are convinced that the initial consonant must have been the laryngeal occlusive, the glottal catch. Nevertheless, it is rather indubitable that this conviction is a prejudice, an *idolon specus*, based on the phonological tendencies of modern Teutonic languages. Cp. the unsophisticated dictum by Heusler: "Die agerm. Prosa hatte wahrscheinlich weichen Einsatz; aber zur Auszeichnung stabender Vokale verfällt man—the speaker of Modern German!—beinah von selbst auf den scharfen." We have no right to vindicate such speech habits for the Early Teutonic period. On the contrary, it is more likely that the sound in question was a fricative (M. SCHOLZ in *Zeitschrift für romanische Philologie* 37/38, 387); after the reasoning taught us by the late TRUBETZKOY, we must be inclined to formulate: a voiced *h* in opposition to the common voiceless *h* of Teutonic.—In personal conversation ROLF PIPPING suggested that it should be investigated if the curious early loss of *h*- in runic inscriptions of Uppland as well as the widely spread loss of *h*- in the corresponding Swedish dialect of Roslagen might be explained through sandhi-levelling of voiceless and voiced *h*-.

⁷ As for Armenian, which—like Greek and Teutonic—developed a voiceless *h*-, cp. note ³ to § 16.

⁸ Besides *hu* > (*hy* =) *au* the Indo-European languages certainly also sometimes displayed *hi* > (*yi* =) *ai*, though—according to the partly but not wholly congruous phonetic conditions—in another geographical distribution and perhaps less regularly. A prominent case is the Centum-Satəm ending *-ai* (= *-yi*) < *-hi* of the 1. sg. med. pres. ind. (OI *heite*, Skr. *bhāre*, etc.), corresponding to the Hittite ending *-hi* < *-hi* of the 1. sg. act. pres.

ad § 14

On *p* in Celtic cp. HENRY LEWIS and HOLGER PEDERSEN, *A Concise Comparative Celtic Grammar* (Göttingen 1937), 26 f.

¹ It is tempting to assume precisely the same development in Armenian. (1) Here, too, IE *p*, *t*, *k* were primarily aspirated and became *ph*, *th*, *kh*; and *th*, *kh* were preserved as such: *l'e* 'that', conjunction (Lith. *te*, OE *þe*), *elik'*, aor. 'I let' (Satəm *-k-*, IE *-k^h-*: Gk *ἔλιπε*, Lat. *linquit*). But **ph* became *h* (*hur* 'fire', Gk *πῦρ*; *hel* 'trace, foot print', Gk *πέδον* 'soil') or was lost (*otn* 'foot', Gk *πόδα*, acc.). (2) In words like *gitem* 'I know' (Skr. *vēda*, Gk *φοῖδα*), *gorc* 'work' (Gk *φόργανον*), *zgenum* 'I dress' (Gk *φέρνυμι*), *gin* 'price' (Skr. *vasnám*), Armenian presupposes *g^h-* and, prior to that, an emphatic *u-*. (3) It is perfectly clear that in cases like Goth. *bliggwan*, OI *hoggva* (Dan. *hugge*), Cymr. *gweddw*, *gwydd*, Arm. *gitem*, *gorc*, etc., the development *u* > *g^h* > *g* is a differentiation. With regard to Armenian this is confirmed when we observe that in the middle of the word IE *-u-* was generally preserved between vowels (*kouu*, gen. of

kow 'cow'; *liw* 'day' (< **diwo-*), but in the neighbourhood of sonants was either lost (*sor* 'cavern' (< **kour-*, cp. Lat. *caverna*); *nor* 'new', cp. Gk $\nu\epsilon\phi\alpha\rho\acute{o}\varsigma$) or appeared as *-g-*: *kogi* 'butter' (cp. Skr. *gávyaḥ* 'of the cow'), *taigr* 'brother-in-law' (< **daiur-*, cp. Skr. *devár-*, Gk $\delta\alpha\acute{\eta}\rho$): a fricative that is threatened with extinction or reduction is apt to harden into occlusive + fricative, whence eventually occlusive alone (MELLET, Esquisse 50; cp. Bulletin de la Société Linguistique de Copenhague VI (1939/40: 1941), 34). (4) All that may be rather simple. But what is really puzzling is why the initial *u* was emphatic both in Celtic and in Armenian. This is most easily understood when we assume that in both languages IE *u-* and *fiu-* did not fuse into *u-*, but into *fiu-* (> *u-*). Then in both languages the voiced aspirated bilabial fricative *fiu* / *ufi* could draw the voiceless aspirated bilabial occlusive *ph* into an opposition which proved destructive to the occlusive element of *ph*.

ad § 15

¹ Cp. KURYŁOWICZ, Études 67 (and KUIPER, Notes 22), but the details are seen in a different light.

² HOLGER PEDERSEN, Hittitisch 187 f. (different in details).

³ Other opinions on *lawō*, etc., e. g. HANS HENDRIKSEN 31 and 93; STURTEVANT, Laryngeals 63.

⁴ *Pāṇini* 8, 4, 56; WHITNEY § 141. A different opinion on *ásrk* is held by STURTEVANT (Language 16, 86 and 17, 186).

⁵ Such dissimilations are by no means unknown in Sanskrit; cp. *t > k* in cases like *patilá-*—*páliknī* 'livid', *ásita-*—*ásiknī* 'black' (BRUGMANN, Grundriss 2, 1, 215 with bibliography).

⁶ Cp. on the Armenian word for 'liver' especially J. SCHMIDT KZ 25, 23 and HOLGER PEDERSEN KZ 32, 241.

⁷ If these three words are rightly conceived as IE **esh₁*, **iek^u₁*, **kek^u₁*, then we might compare the word for 'fire', treated above p. 36 (**p-hur* / **p-uh₁*), and remember the many cases of long vowel in the *r/n*-words (Gk $\acute{\upsilon}\delta\omega\rho$, etc.), so that we might raise the question if the *r/n*-stems should more correctly be called *hr/nn*-stems. I shall not enter into this matter now.

ad § 16

¹ Cp. the discussion and bibliography by HANS HENDRIKSEN 62.

² There has been a vivid discussion as to the phonetic value of Indo-European laryngeals, started by HERMAN MÖLLER and recently continued by STURTEVANT and his collaborators and pupils (cp. e. g. the study by BENJAMIN SCHWARTZ, cited in the first note above p. 65). This discussion has been hampered by the conception of Indo-European possessing more than one laryngeal phoneme. Without always realizing the necessity of starting from one Indo-European laryngeal, several

scholars (HOLGER PEDERSEN, KURYLOWICZ, STURTEVANT, and others) have rightly maintained the sonantic—i. e. both consonantal and vocalic—character of the Indo-European laryngeal. But since no detailed investigations had been made, it is no wonder that as late as 1943 a sober philologist like FRANKLIN EDGERTON felt bound to write these cautious words: “it may turn out that *ə* too in the pattern of (say) Indo-Hittite, stood in the same relation to what are called laryngeal consonants, in which *i* stood to *y* [i. e. *i*]. I will go so far as to say that such a theory seems to me abstractly quite reasonable, though still very speculative” (Language 19, 108).

When we, however, realize, in referring a possible plurality of laryngeals to a Pre-Indo-European period, that Indo-European did not possess more than one laryngeal phoneme, and when we—as has here been tried—register the effects of this phoneme, we have a possibility of making the theory of the laryngeal sonant less speculative, more palpable.

Naturally, we shall take care never to leave out of consideration that all we may know of the phonemes in a remote language, is very limited. This applies, however, not only to the Indo-European laryngeal, but to all phonemes of the reconstructed Indo-European language: we can also have but a vague conception of the phonetic value of IE *i/ī*, *u/y*, etc. But in treating a dead language, e. g. previous stages of existing languages, it is always our duty to try to form a phonetic conception of its phonemes; that is to say: we must indicate well-known sounds in existing languages having the same effects as the postulated phonemes of the language no more existing. If we omit this phonetic identification of ancient phonemes with existing sounds, we bar the way to a scientific treatment of the phonemic patterns as well as of the phonological evolution; we should relapse into the unfruitful and void methods of the (semi)philosophical phonology of the early nineteenth century.

³ In Armenian a voiceless *h* developed out of *p* (*hayr* ‘father’, Lat. *pater*), *s* (*hin* ‘old’, Lat. *senex*), and in loanwords (*hazar* ‘1000’, cp. Av. *hazawra*). With this *h* the laryngeal, the voiced *h̄*, fused, because it was unvoiced like other voiced consonants of Armenian: *b > p* (*stipem* ‘I press’, Gk στῖβρός ‘pressed’), *d > t* (*ateam* ‘I hate’, Lat. *ōdi*), *g > k* (*kow* ‘cow’, Lat. *bōs*, Skr. *gāūḥ*). Armenian *h* is rather unstable—cp. *hogi/ogi* ‘spirit’ (*h < p*); *haravunk* ‘arable soil’, but *aravr* ‘plough’ (*h < h̄*);—so an Armenian *h*-, when corresponding to vocalic initial in other Indo-European languages, is not such a reliable indicator of the IE laryngeal as is Hittite *h*. Cp. MEILLET, *Esquisse* 28–30, 38.

⁴ O. JESPERSEN, *Lehrbuch der Phonetik* § 6, 22; DANIEL JONES, *English Phonetics*⁶ § 555 note 16; P. SKAUTRUP, *Klusiler og yngre Stød i Vestjydske* (*Acta Philologica Scandinavica* 3, 22–51); P. JØRGENSEN, *Klusilspring* (*Danske Folkemaal* 1, 133 ff.). Cp. the development of laryngeal *h* into velar *x/k* in Modern Icelandic (and Norwegian B), mentioned above p. 5.

ad § 17

The common opinion as to the Italic unvoicing of the aspirated mediae is found in all handbooks: BRUGMANN, HIRT, SOMMER, MEILLET-VENDRYES, STOLZ-LEUMANN. I have generally made use of the same examples as found in these works.

¹ Teutonic languages preserving the velar spirant [g] nevertheless change this sound into occlusive after nasal. Gothic *g* is presumably a spirant in all positions, except after nasal, where an occlusive is clearly indicated in such words as *laggs* 'long', *sigggwan* 'sing'. Dutch *g* is always a spirant, with the exception of the position after nasal in words like *bongert* [boŋ,grt] 'orchard', *honger* [hoŋgr/høŋr] 'hunger'.

² The same is seen in *hasla* < **ghast-* < **ghadhst-* and *custos* < **kudhst-*: in Italic the aspiration is not carried beyond the *-s-*; correspondingly in Celtic where the aspiration has to be lost in any case (cp. p. 34): Mr. *gas* 'willow-twig' < Prim. Celtic **ga(d)st-* < **ghadhst-*. (Another possibility is that *s* is lost in *-dhst-* after the development *-dht-* > *-ss-* had expired; this is seen in Mr. *gal* 'sprig, surculus' < Prim. Celtic **gast-* < **ghadh(s)t-*). In Greek—where the law of Bartholomae is effective—*-st-* in such cases is aspirated and voiced, but the voicing is then regularly given up: **kudhst-* > **ku(dh)zdh* > *kusth-* in κῦσθός 'vulva' (cp. **mizdh-* (Goth. *mizdo*) > *misth-* in μισθός). In Teutonic we have primitively the same development as in Greek, but the voicing is of course retained: **kudhst-* > **ku(dh)zdh-* > Goth. *huzd* 'treasure, hoard'; **ghadhst-* > **gha(dh)zdh-* > *gazd-* in Goth. *gazds* 'goad'. If the old combination of Lat. *casus* with Gk κἀσῆρος should be exact, we have here the same Italic development: **kadhst-* > *cast-*.—See the bibliography of these disputed words in FEIST, Vgl. Wb. d. got. Sprache³, Leiden 1939, s. vv. *gazds*, *huzd*.

ad § 18

¹ When we take into consideration that Teutonic seems to have retained the laryngeal before vowels (§ 13 in fine) and that in Celtic *uu-* and *u-* fuse into *uu-* (§ 14), we should not be astonished if the laryngeal before *i* should display parallel developments. The preservation of initial *i* in the central groups of both Teutonic and Celtic as against the loss of initial *i* in marginal groups (Iceland, Norway, and Switzerland;—Ireland) might in fact point to an old vacillation between fusion of *ui-* and *i-* into *i-* and fusion of *ui-* and *i-* into *ui-* (or perhaps to *ui-*—as original result of the fusion—having partly lost *u* in sandhi). The consequence would have been that in the central groups *i-*, in marginal groups *ui-* had been generalized. Since neither Celtic nor Teutonic preserve *i* in initial clusters, *i* must in both languages be lost in the initial cluster *ui-* (and the resulting *u-* must naturally fuse with pure vocalic beginning). In considering initial *ui-* as a cluster in Pre-Celtic and Pre-Teutonic, we start from the assumption that no assimilation of *ui-* had taken place here—as initially in Greek (§ 7), in postvocalic position in Hittite (§ 12), in several IE languages after velar (§§ 8—11). The only

case comparable in Pre-Celtic and Pre-Teutonic is the position after velar, and this is not very helpful, as it affords few words and gives no reliable clue: Celtic has the assimilation (O.Ir. *dú*, *indhé*), Teutonic has not (Goth. *guma*, *gistradagis*, OI *i gær*); cp. above p. 23 f.

² In return a certain aversion of the Satam languages to labialization seems observable. The Indo-European labiovelars are materialized as pure velars; rounding of velars or dentals is perhaps unknown; rounding of *u/m* is excluded; rounding of *r/l* is rare (cp. Skr. *pūrṇá-*—*stirṇá-*, etc.).

³ Hittite: *ha-aš-la-i* 'bone' (Gk ὀστέον), *a-ap-pa* 'back' (Gk ἄπο), *la-a-man* 'name' (Lat. *nōmen* or Gk ὄνομα), *ta-ma-a-iš* 'other' (Gk δῆμος, Dor. δᾰμος; HOLGER PEDERSEN, Hitt. p. 54). Tocharian: B *aknātsa* (Gk ἄγνωτός), B *mācer*³ (Lat. *māter*). Celtic: OIr. *gnáth* (Gk γνωτός), *máthir* (Lat. *māter*). Teutonic: Goth. *ahtau* (Lat. *octo*), *akrs* (Lat. *ager*), *flodus* (cp. Gk πλωτός), OS *mōdar* (Lat. *māter*). Albanese: *na* 'we' (Lat. *nos-ter*), *prapē* 'again, back' (Gk ἄπο). Balto-Slavonic: Lith. *praszyti* 'ask', OSlav. *prositi* (cp. Lat. *pro-cus*), Lith. *aszis*, OSlav. *osī* (Lat. *avis*), Lith. *prō*, OSlav. *pra-* (Lat. *prō(d)*), Lith. *stóli*, Lett. *stāt*, Pruss. *po-stāt*, OSlav. *stati* (Lat. *stāre*).—It is well-known that the distinction between *o* and *a* in Armenian (*o*¹ = *o*, *o*² = *a*) differs from that of Tocharian-Greek-Latin-Celtic, and that likewise the distinction between *ō* and *ā* in Lithuanian (*ō*¹ = *ā* > *ō*; *ō*² > **oa* > *uo*) is not identical with that of Greek-Latin-Albanese-Armenian; *ō*² (*ō*² < *oH*) has not the same apophony with *e* as *ō*¹ has. Armenian *ō*¹: *orb* 'orphan' (Lat. *orbis*), *ō*²: *akn* 'eye' (Lat. *oculus*), *a*: *argel* 'obstacle' (Lat. *arceō*). Lithuanian *ō*¹: *prō* 'past, past and gone' (Lat. *prō(d)*), *ā*: *motė* 'woman' (Lat. *māter*), *ō*²: *dūoti* 'give' (cp. Lat. *dōnum*). Cp. DE SAUSSURE, Mémoire sur le système primitif des voyelles dans les langues indo-européennes, Leipzig 1879, 96; BRUGMANN-DELBRÜCK I §§ 138–192; HIRT, Idg. Gramm. § 52 ff.

ad § 19

¹ HANS HENDRIKSEN, p. 26.

² HOLGER PEDERSEN, Hitt. p. 176 f.

³ A different opinion on */wehtsi/* Language 17, 186 (STURTEVANT).

ad § 20

Against the ingenious deliberations of STURTEVANT and his followers concerning the "Indo-Hittite" laryngeals, one might perhaps raise the fundamental objection that two of his four laryngeals have admittedly left no palpable trace either in Hittite or in other Indo-European languages (their existence depends solely upon theoretical considerations on the origin of the consonantal pattern of Indo-European), and that the difference between the remaining two is based on the difference between *-h-* and *-hh-* in Hittite writing, with the inference that *-h-* should represent one laryngeal, *-hh-* another. But since, with few exceptions, *-h-* occurs after *e/i*, *-hh-* after *a* and *u*, the difference cannot be phonemic and has no historical foundation outside Hittite. At its best—viz. if it

is not merely graphic—it may be phonetic, indicating that the Hittite *h*-sound after front vowels was phonetically different from that after back vowels; we may adequately compare the German *ch*-phoneme, which is an *ich*-sound after front vowels (and consonants), but an *ach*-sound after back vowels.

We are all much indebted to EDGAR H. STURTEVANT who has solved so many riddles of Hittite texts, but on account of these fundamental considerations, I have in most cases refrained from mentioning deviations from his views.

The recently published study by BENJAMIN SCHWARTZ, *The Root and its Modification in Primitive Indo-European*, is a very valuable contribution to our knowledge and theories. The system of root-modification which is here drawn up, in continuation of the work of BENVENISTE, to my mind is mostly convincing, and must indeed, as its author rightly suggests (p. 57), become the basis of future tentative etymological comparison with non-Indo-European languages. I am further very much under the impression of the brilliant clearness of the laryngealistic part of the study; but I can offer no definite opinion about it, (nor about several other theories of laryngeals and apophony), because I am miserably heretic in regard to two main points: (1) *e* as a basic vowel, (2) stress as a dominant factor in Pre-Indo-European (conceptions like 'schwundstufe', 'reduktionsstufe').

The theories in question are, explicitly or implicitly, based on the assumption that the vowel subjected to Indo-European apophony was no phoneme in Pre-Indo-European. But then it seems necessary to conclude: (1) if the language had no vocalic phonemes, the occurring vowels had no phonemically relevant quality (there was no reason why a vowel should be materialized as *e* rather than *a* or *o*); (2) if the vowel was no phoneme, it was phonemically of no importance whether it was materialized or not: this latter conclusion fundamentally accounts for the origin of the zero-grade in Pre-Indo-European. The Indo-European regulation, making absence or presence of a vowel relevant, need not be,—indeed, cannot be dependent on stress. It stands to reason that the difference between *e*- and *o*-grade has some bearing upon a tonal accentuation, as actually seen in early Indo-European. And with regard to the tonal accentuation of the zero-grade, it is self-evident that no accentuation is possible where no sound capable of bearing an accent is materialized (as is the case of the zero-grade of roots consisting wholly of occlusives or *s*); and where a sound capable of bearing an accent is materialized (as is the case with vocalized sonants in the zero-grade), there are in fact, in early Indo-European—outside the sphere of palpable analogy—many instances of accentuation of the zero-grade.

Finally: it would perhaps be recommendable to make an effort towards the solution of problems of Indo-European vocalism (e. g. the problems of *o*²) with Indo-European facts, before constructing theories of Pre-Indo-European vocalism.

ad Appendix

¹ A mystery of Hittite is the treatment of the thematic vowel. In Gothic, in Latin, in Attic Greek, in classical Sanskrit, and in most of the other Indo-European languages, there is a clear distinction between words with thematic vowel and words without: nouns are generally either consonant stems, *i*-stems, *u*-stems, or they are *o*-stems, *io*-stems, *uo*-stems; verbs are either athematic or thematic. It is true that there are exceptions and that especially in the early phases, as in Homeric Greek and in Vedic, a noun which is e. g. an *i*-stem may have one or more cases according to the *io*-stems, that a thematic verb may have some athematic forms, etc. But in Hittite this is more widely spread: it is hard to separate consonant stems from *o*-stems; there is no difference between *i*- and *io*-stems; certain *u*-stems are mixing with the corresponding *uo*-stems; and it is almost the rule that a *mi*-verb has some forms according to the *hi*-conjugation and inversely.

To sum up, even if, in Hittite as in the other Indo-European languages, the use of the thematic vowel is puzzling or—more precisely—actually meaningless, the lack of valid rules of distribution of thematic and athematic forms, the great number of “exceptions”, must involve the conclusion that Hittite was nearer than any other Indo-European language to a state of things where the thematic vowel had a well defined function which was perhaps the same in (Indo-European) nouns and verbs.

² We ought to keep in mind that what has here been built up, is a construction of elements some of which are more reliable than others.

I should deem it rather certain that—as HOLGER PEDERSEN ASSUMES—the well-known IE root form **d̥iēu-* has produced Hittite *šiw-/siu-* in *šī-i-wa-az* ‘day’, *šī-i-wa-an-ni-iš* — *šī-(i)-ū-na-aš* — *šī-(i)-ū-ni-iš* ‘god’. And I should think that the corresponding **d̥iēi-* is found in *šī-ya-a-ri* ‘appears’. Furthermore there can hardly be any doubt regarding the supposition that the derivative *-n-* of *šī-ū-na-aš* — *šī-ū-ni-iš*, *šī-i-wa-an-ni-iš* must be the well-known *-n-* of colour adjectives (better: adjectives of visual perception) and of names of divinities. Finally I should venture to reckon it very probable that the adjective *šu-up-(pí)-iš* — *šu-up-pa-aš* ‘sacrosanct, clean’ was derived from the same root, not, however, with the long grade of apophony, but with the well-known zero-grade **d̥ju* . . (hardly the high grade **d̥iēu* . .), and with another typical derivative of adjectives of visual perception, viz. the old *-bh-*.

It is probable that the rare DINGIR-*uš* may simply represent *šī-uš* < **d̥iēus* = Skr. *Dyáuh*, Gk *Ζεός*. And it is probable that the *-nn-* of *šī-i-wa-an-ni-iš*—provided the graphic covers a phonetic reality—goes back to *-ln-*.

It is quite uncertain which IE vowel is represented through the *-a-* of *šī-i-wa-az* and *šī-i-wa-an-ni-iš*. We do not know if the *-n-* of *šī-ū-na-aš* — *šī-ū-ni-iš* goes back to *-ln-*. Nor do we know if a laryngeal has been lost after the *-u-* in *šī-ū-na-aš* — *šī-ū-ni-iš* or before the occlusive

in *šu-up-pí-iš* — *šu-up-pa-aš*. (As for the latter word we might refer to Skr. $\sqrt{dyūt}$ 'plays, gambles' with a sense derived from that of \sqrt{dyul} 'shines, glitters, plays', where *dyūt* might phonemically be the original form (< **diūt*?) and *dyul* the secondary one; but it is perhaps more probable that *dyūt* has expressive lengthening). We cannot decide if the *-pp-* of *šu-up-pí-iš* — *šu-up-pa-aš* represents *-lbh-* or *-ubh-* or *-ntbh-* or something else.

In the case of *ši-ú-ni-iš* besides *ši-ú-na-aš*, the fact that we have only derivatives of the *i*-stem (the abstract noun *ši-ú-ni-ya-tar* 'divinity', and the denominative verb *ši-ú-ni-ah-ha-ri* 'become divine') does not prove the *i*-stem to be older than the *a*-stem (EHELOLF l. c.); it may just as well be that we find living derivatives of the normal *i*-stem of the texts, whereas the antiquated *a*-stem—to say nothing of the isolated *ši-uš*—has lost the power of forming derivatives. It is not improbable that *ši-ú-na-aš* (*ši-ú-ni-iš*) was originally masculine and *ši-i-wa-an-ni-iš* originally feminine, but the supposition has not been proved.

Abbreviations.

I

Alb.: Albanese	Lith.: Lithuanian
Ar.: Aryan	MHG: Middle High German
Arm.: Armenian	M(,)Ir.: Middle Irish
Av.: Avestan	Mod.: Modern
Balt.: Baltic	Norw.: Norwegian
Boeot.: Boeotian	O.: Old
Bret.: Breton	OE: Old English
Corn.: Cornish	OHG: Old High German
Cymr.: Cymric	OI: Old Icelandic
Dan.: Danish	O(,)Ir.: Old Irish
Dor.: Doric	OS: Old Saxon
Eng.: English	Osc.: Oscan
Fris.: Frisian	O(,)Sl(av): Old Slavonic
Gaul.: Gaulish	Pers.: Persian
Germ.: German	Phryg.: Phrygian
Gk.: Greek	Prākṛ.: Prakrit
Goth.: Gothic	Pruss.: Prussian
Hitt.: Hittite	Russ.: Russian
Icel.: Icelandic	Skr.: Sanskrit
IE: Indo-European	Slav.: Slavonic
Ion.: Ionian	Swed.: Swedish
Ir.: Irish	Teut.: Teutonic
It.: Italic	Toch.: Tocharian
Lat.: Latin	Umbr.: Umbrian
Lett.: Lettish	

II

abl.: ablative	dat.: dative
acc.: accusative	du.: dual
act.: active	fut.: future
adj.: adjective	gen.: genitive
adv.: adverb	imp.: imperative
aor.: aorist	impf.: imperfect
comp.: comparative	ind.: indicative
conj.: conjunctive	instr.: instrumental

loc.: locative	pres.: present
med.: medium	pr(e)t.: preterite
nom.: nominative	pron.: pronoun
num.: numeral	sg.: singular
part.: participle	subst.: substantive
perf.: perfect	s. v. (vv.): under the headword(s)
pers.: person	>: developing into
pl.: plural	<: derived from
p. p.: perfect participle	

III

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Index of Words.

Words which are only cited as examples of well-known facts, have generally been omitted.

Order of languages: 1. Indo-European, 2. Hittite, 3. Greek, 4. Teutonic, 5. Celtic, 6. Italic, 7. Tocharian, 8. Indo-Iranian, 9. Armenian, 10. Balto-Slavonic (a. Baltic, b. Slavonic), 11. Albanese.

1. Indo-European.

Alphabetic order: *a, e (e²), o (o²); fi, i, u, r, l, n, m; k (k^h), kⁱ, k^u, g, g^h, gⁱ, g^{ih}, g^u, g^{uh}; t (t^h), d, d^h; p (p^h), b, b^h; s.*

NB. The following symbols deviate from those of the text: $\tilde{fi} = fi$, $k^h = kh$, $k^i = \tilde{k}$, $g^h = gh$, $g^i = \tilde{g}$, $g^{ih} = \tilde{g}h$, $g^{uh} = g^uh$, $t^h = th$, $d^h = dh$, $p^h = ph$;
 $b^h = bh$.

- | | | |
|---|---|---|
| <p>*<i>egⁱfi</i> / <i>egⁱfi</i> / <i>egⁱofi</i> 16 f.
 *<i>esfir</i> / <i>esfi-n-</i> 37-39. 72
 *<i>ofius</i> 70
 *<i>fiⁱei-</i> (?) 8
 *<i>rkⁱfi^o-</i> 17-25
 *<i>fiarfiⁱ-</i> 26. 57
 *<i>fiufio-</i> 31. 70
 *<i>fiⁱeu-</i> (14). 68
 *<i>fiⁱeu^g-</i> (14). 68
 *<i>fiⁱes-</i> (14). 68
 *<i>fi^o2fis-</i> (14). 68
 *<i>fiⁱu(fi)s-</i> (14). 68
 *<i>fi^uefi-</i> 6
 *<i>fi^uefint-</i> 6. 66
 *<i>fi^uer-</i> (?) 7
 *<i>fi^uerd^h-</i> 6
 *<i>fi^uel-</i> (?) 7
 *<i>fi^ued^h-</i> 6
 *(<i>fi</i>)<i>uid^heuafi</i> 33
 *<i>fi^uek-</i> (?) 12
 <i>fi^ueg-</i> 12</p> | <p><i>fi^uregⁱ-</i> (?) 12
 *<i>fi^ureg^u-</i> 12
 *<i>fi^urud^hfi^{ro}-</i> (?) 70
 *<i>fi^ule(fi)ligiofi</i> 8
 *<i>fi^uleik-</i> 8
 *<i>fi^uleig-</i> 8
 *<i>fi^uleit-</i> '(cup of) fruit-
 wine' 8
 *<i>fi^uleit-</i> 'loth' 8
 *<i>fi^uleu-</i> / <i>fil^u-</i> 8
 *<i>fi^uleud^h-</i> 8
 *<i>fi^ulofi^upekⁱ-</i> (?) 8
 *<i>fi^uli-nu-</i> 8
 *<i>fi^ulu^guh-</i> 8
 *<i>fi^unefi-</i> 8
 *<i>fi^uneid-</i> 7
 *<i>fi^uneum</i> 7
 *<i>fi^uner-</i> 7
 *<i>fi^unep-fit-</i> 7
 *<i>fi^unomn-</i> 7
 <i>fi^unefi-</i> 7</p> | <p><i>fi^umergⁱ-</i> 7
 *<i>fi^umelgⁱ-</i> 7
 *<i>fi^umet-</i> 7
 *<i>fi^uek^ufir</i> / <i>fi^uek^ufin-</i> 38 f. 72
 *<i>fi^ueg^{ih}-</i> 57
 *<i>fi^uid-</i> 33
 *<i>fi^ureud^h-</i>, see *<i>fi^urud^hfi^{ro}-</i>
 *<i>fi^uregⁱfi^o-</i> / <i>rekⁱfi^o-</i> 17
 -21
 *<i>fi^ulofi^u-</i> 36
 *<i>fi^uliek^ufir</i>, see *<i>fi^uek^ufir</i>
 *<i>fi^umegⁱfi</i> 16
 *<i>fi^ukorfiⁱ-</i> 26
 *<i>fi^ukⁱad^hst-</i> 74
 *<i>fi^ukⁱek^ufir</i> / <i>fi^ukⁱek^ufin-</i> 38 f.
 72
 *<i>fi^ukⁱorfi^s(n)-</i> 56
 *<i>fi^ukⁱoli-</i> 56
 *<i>fi^ukⁱonfi-</i> 56 f.
 *<i>fi^ukⁱud^hst-</i> 74
 *<i>fi^ukⁱfi^uia(i)-</i> 17-20</p> |
|---|---|---|

- **kⁱfijēi-* 17–22. 24 f.
 **kⁱfijen-* 17–20
 **kⁱfijifin-* 17–22
 **kⁱred-d^hefi-* 47
 **gⁱal-* 56
 **gⁱenfiimen-* 68
 **gⁱolkī-* 56
 **gⁱonfijotor-* (?) 25. 56 f.
 **gⁱfijēs* 17–24
 **gⁱfijōm* 17–25
 **gⁱfiju(s)* 17–24
 **gⁱ-nfi-u* 36
 **gⁱhad^hst-* 74
- **gⁱh-i-m-* 19–25
 **g^uelb^h-* 55
 **g^ufijēi-* 17–20. 24 f.
 **g^ufijer-* 17–21. 24 f.
 **g^ufijen-* 17–20
 **g^uen-* 20 f.
 **tek-* 69
 **tekⁱfijōn* 17–20. 23 f.
 **domfij-* 25
 **dijū-* / *dju-* 27. 62–64
 **dl-fi-* 35
 **d^hefi-* 36
 **d^hugfiter-* / *d^hugfiter-* 16
- **pellimen-* 68
 **poij-* 25. 36
 **pij-*, see **poij-*
 **p-u-fi-* 36. 72
 **p-fi-u-* 36. 72
 **pl-fi-* 35
 **sems* 9
 **steid^h-* 10
 **stejb-* 10
 **smifi* 9
 **str-fi-* 35

2. Hittite.

Alphabetic order (parallel to Indo-European): *a, e/i, u; y, w/u, r, l, n, m; k/g, h(x)/γ, t/d, p/b; š(s), z*. Forms without hyphen are simplified transcriptions.

- a-ap-pa* 29. 75
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estsī 29
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la-a-man 75
la-a-hu-i 36
ne-ku-ma-an-za 55. 58
kar-aš-mi 26. 57
gi-e-nu (ganut, instr.) 36. 57
gimra 25
ku-en-zi 55. 58
ku-iš 55. 58
ha-ar-aš-ni, har-ša-ni 56. 58
- ha-a-li-ya* 56
ha-an-na-a-i 56
ha-an-ša-tar 25. 56 f.
ha-aš-ta-i 29. 75
har-aš-zi 26. 57
hal-ki-iš 56. 58
hal-za-a-i 56
hanti 29
henkan 29
hu-el-pi-iš 55
hu-it-ti-ya-zi 6
hu-iš-zi 6
hu-u-i-tar 55
hu-u-wa-ar-dah-hi 6
hu-ul-la-a-i 55
hu-wa-a-i 55
hu-wa-an-te-eš 6. 66 f.
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xuga- Lycian 31. 70
huhhas 29. 31. 70
huške-, hu-uš-ki-it 31. 70
- ta-ma-a-iš* 75
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pa-a-aš-zi 25
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ši-uš 27. 77 f.
ši-ya-a-ri 26 f. 62–64. 77
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3. Greek.

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 ἄεθλος 6. 67
- ἄειρω 7
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- ἄησι 6. 29. 67
 ἄλεισον 8. 29. 67
 ἄλείτης 8. 11. 29

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 ἄλληκτος 10
 ἄλοιτός 8. 29. 67
 ἄλς 9
 ἀλώπηξ 8. 29
 ἀμάω 7. 9. 67
 ἀμέλω 7. 29
 ἀμέργω 7. 29
 ἀνδροκτασίη 18
 ἀνεπιός 7. 29
 ἀνήρ 7. 9. 29. 67
 ἄορτήρ 7
 ἄπτω 13
 ἄργυφος 63
 ἀρηίφατος 18
 ἀρίζηλος 27. 70
 ἄρκτος 17—25. 29
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 ζέλκια Phryg. 56
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 κατακτείνω 18 f.
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 κέκτημαι 18
 κέρας 56
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 κτέαρ 18
 κτείνω 17—20
 κτέρα 18
 κτίζω 17—22. 24 f.
 κτίλος 18
 κτίσις 18. 20
 κτοίνα (Rhodos) 18. 22
 κτύπος 18
 κύσθος 74
 λαγαρός 10
 λείμαξ 10
 λείος 10
 λείπω 8. 10
 λευκός 9
 λέχος 9
 λήγω 10
 λιπαρός 38
 λοιγός 8
 λούω 36
 λύγξ 10
 λύζω 10
 λύω 9
 λωγάνιον 10
 μέγας 8. 16
 μέμονα 8
 μήτηρ 8
 μία (from εἶς) 9
 μικρός 9
 μισθός 8. 74
 μύρον 9
 μῦς 8
 νάει 9
 ναῦς 8
 ν(ε)ίφει 9
 νέος 8
 νεῦρον 9
 νεφέλη 8
 νέφος 8
 νη- 8
 νῆ 9
 νήχω 9
 νίζω 13
 νύξ 8
 νυός 9
 ὄζω 13
 ὄκταλλος Boeot. 18
 ὀλιβράζω 10
 ὀλιβρός 10
 ὀλίγος 8. 10. 29
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πελλός 62	ὑμεῖς 30	χθές 17—24
πέταλος 70	ὑμήν 30	χθεισινός 18
πίμπλημι 35	ὑμμες Lesbian 70	χθιζός 18
πίνω 36	ὑπερ 30	χθόνιος 18 f. 24 f.
πλήρης 35	ὑπνος 30	χθών 17—25. 68 f.
ποῦ 50	ὑπο 30	χίμαρος 19
πρόχην 36	ὑς 30	χιών 19. 23
πῦρ 36	ὑσμίνη 13. 30	(εἰς) ὦπα 18
ῥέζω 12	ὑστερος 30	ὦς Doric 31
ῥυκάνη 12		

4. Teutonic.

Words without special indication are Gothic.
In the alphabetic order *þ* follows upon *t*, *ð* upon *d*;
ā (*æ*), *ō* (*o*) stand for *ae*, *oe*.

<i>ægte</i> Dan. (adj.) 45	<i>brjdguma</i> OE 23	<i>fidwor</i> 50
<i>æspe</i> OE 52	<i>bugt</i> Dan. 45	<i>fimf</i> OHG 53
<i>aflinnan</i> 8	<i>callian</i> OE 56	<i>fimm</i> OI 53
<i>agt</i> Dan. 45	<i>chicken</i> Eng. 42	<i>fire</i> Eng. 36
<i>ár</i> OI 50	<i>chill</i> Eng. 52	<i>fiur</i> OHG 36
<i>arjan</i> 26. 57	<i>chint</i> OHG 53	<i>fjörgyn(n)</i> OI 64
<i>augo</i> 18	<i>cnihht</i> OE 53	<i>fon</i> 36
<i>aukan</i> 31	<i>daddjan</i> 36	<i>Freyja</i> OI 64
<i>auso</i> 31	<i>dægge</i> Dan. 36	<i>Freyr</i> OI 64
* <i>austra-</i> 31	<i>dauhtar</i> 16	<i>für</i> OHG 36
<i>awi-zorahht</i> OHG 18	<i>die</i> Dan. 36	<i>fulls</i> 35
<i>awo</i> 31	<i>ek</i> OI 17	<i>funcho</i> OHG 36
<i>bęzzivo</i> OHG 53	<i>ener</i> OHG 50	<i>funin(s)</i> (dat., gen.) 36
<i>bongert</i> Dutch 74	<i>fancho</i> OHG 36	<i>funisks</i> 36
<i>brün</i> OHG 63	<i>feuer</i> Germ. 36	<i>furt</i> OHG 50

- gakannjan* 56
gaman 8
ganaitjan 7
gawigan 57
gazds 74
Gentofte Dan. 57
geostran OE 23
gestaron OHG 23
gestli OHG 53
gibirgi OHG 53
gimmerlam Dan. 23
gistradagis 23.75
gius O. Swed. 23 f.
gjalde Dan. 57
Gjentofte Dan. 57
gjøre Dan. 57
gjorde Dan. 57
gøre Dan. 57
gös Mod. Swed. 23 f.
góimánadr OI 23
grēbit OHG 53
gugl Dan. (West-Jutland) 42
guma 23. 75
gymbri OI 23
halþs 56
hēben MHG 53
heite OI 71
helpan OE 52
hjáarta Swed. 5
hjarta Mod. Icel. 5
hjerta OI 4
hjerte Dan. 5
hjørtr OI 4
hjouwer Mod. Fris. 4 f.
hlæja Mod. Icel. 5
hliehhan OE 4
hnot Mod. Icel. 5
hnutu OE 4
hongre Dutch 74
hring OE 4
hringur Mod. Icel. 5
huljan 50
hulþs 56
hund 50
huzd 74
hva Dan. (Jutland) 5
hvad Dan. 5
hvalp Dan. 55
hvilikur Mod. Icel. 5
hwal Fris. 5
hwilt OE 4
i gaar Dan. 23
í gær OI 23. 75
igen Dan. 57
igjen Dan. 57
ik 17
is OE, OS 53
jener OHG 50
jesan OHG 14. 68
juk 14. 68
kær Dan. 57
kalla OI 56
kann 56
kende Dan. 57
kil Dutch 52
kinnus 37. 56
kjær Dan. 57
kjende Dan. 57
Kjøbenhavn Dan. 57
kjole Dan. 57
kniu 36
København Dan. 57
kuman 50
kva Mod. Norw. 6
lachen Germ. 5
laggs 74
laikan 8
laus 9
lebar OHG 38
lēbēn OHG 53
lēchōn OHG 53
leid Germ. 8
leiðr OI 8
leihts 8
leihwan 9
leiþu (acc. sg.) 8
lēsen MHG 53
lewjan 8
lid OHG 8
ligrs 9
linna OI 8
liudan 8
liuhap 9
liut OHG 8
libor OE 38
loth Eng. 8
lungar OHG 8
māen OHG 7
marka 7
melken Germ. 7
mēnnise OHG 53
mikils 8
mizdo 8
mōdar OS 8
mūs OHG 8
nahts 8
namo 7
ne 8
nebul OHG 8
Nerthus Teutonic 64
nimit OHG 53
niujis 8
niun 7
Njorðr OI 64
nór OI 8
nuss Germ. 5
oheim Germ. 31
ok OI 68
öss OI 70
rēde MHG 53
ring Germ. 5
røgte Dan. 45
seofon OE 53
sibun OHG 53
sibun OS 53
sichur OHG 53
siggwan 74
six OE 53
skera OI 57
skjold Dan. 57
skjule Dan. 57 f.
stēln MHG 53
tāju OHG 36
temja OI 25
tila OHG 36
tivir OI 27
un- 50
vigtig Dan. 45
vonk Dutch 36
vuur Dutch 36

<i>wadi</i> 6	<i>ward</i> 6	<i>whelp</i> Eng. 55
<i>wahsjan</i> 31	<i>Wéden</i> OE 64	<i>winds</i> 66 f.
<i>waian</i> 6	<i>wēhha</i> OHG 53	<i>wisan</i> 6
<i>warm</i> OHG 55	<i>welcher</i> Germ. 5	<i>wulfs</i> 50
<i>wart</i> Eng. 7	<i>welf</i> Germ. 55	<i>zēln</i> MHG 53
<i>water</i> Eng. 42		

5. Celtic.

Words without special indication are Old Irish.

<i>an-</i> 50	<i>dyn</i> Cymr. 24	<i>liach</i> 8
<i>art</i> M.Ir. 24	<i>eontr</i> Bret. 31	<i>lith</i> 8
<i>athir</i> 34	<i>ewythr</i> Cymr. 31	<i>llydan</i> O. Cymr. 34
<i>au</i> 31	<i>fedb</i> 33	<i>máthir</i> 8
<i>ae</i> 31	<i>fid</i> 33	<i>Mediolanum</i> Gaul. 34
<i>awel</i> Corn. 32	<i>gáir</i> 56	<i>nau</i> 8
<i>bó</i> 50	<i>galw</i> Cymr. 56	<i>nél</i> 8
<i>bráthir</i> 34	<i>gam</i> M.Ir. 24. 34	<i>ní</i> 8
<i>carae</i> 34	<i>gas</i> M.Ir. 74	<i>-nocht</i> 8
<i>cechor</i> 38	<i>gat</i> M.Ir. 34. 74	<i>núe</i> 8
<i>cét</i> 50	<i>gi(u)n</i> 37	<i>orc</i> M.Ir. 34
<i>cethir</i> 34	<i>gonim</i> 34	<i>petguar</i> O. Cymr. 34. 50
<i>clethi</i> 50	<i>gúal</i> 34	<i>rit</i> O. Cymr. 50
<i>con-ói</i> 32	<i>gweddw</i> Cymr. 33	<i>rucht</i> 12
<i>críde</i> 50	<i>gwezenn</i> Mod. Bret. 33	<i>sliab</i> 34
<i>den</i> Corn. Bret. 24	<i>gwydd</i> O. Cymr. 33	<i>slóet</i> M.Ir. 10
<i>dere</i> 34	<i>indhé</i> 24. 75	<i>slucim</i> 10
<i>dínu</i> 34. 36	<i>ingen</i> 34	<i>-snigid</i> 9
<i>doe</i> Cymr. 24	<i>karn</i> Cymr. 34	<i>sníid</i> M.Ir. 9
<i>dú</i> 24. 75	<i>lán</i> 35	<i>temel</i> 34
<i>duine</i> 24	<i>lethan</i> 34	<i>tinaid</i> 24
<i>dvy</i> Corn. 24		

6. Italic.

Words without special indication are Latin.

<i>abdomen</i> 46	<i>aper</i> 37	<i>abus</i> 31 f.
<i>aedes</i> 46	<i>arbor</i> 47	<i>-bam</i> 48
<i>aestas</i> 47	<i>aro</i> 26. 57	<i>-bo</i> 48
<i>aestus</i> 47	<i>assyr</i> (<i>asser</i>) 37	<i>brevis</i> 45
<i>aevum</i> 45	<i>audeo</i> 32	<i>canus</i> 63
<i>albus</i> 48. 63	<i>augeo</i> 31	<i>castus</i> 74
<i>Alfius</i> 48	<i>auris</i> 31	<i>centum</i> 50
<i>ango</i> 44	<i>aurora</i> 31	<i>cor</i> 50
<i>anguis</i> 45	<i>avarus</i> 32	<i>credo</i> 47
<i>anser</i> 44	<i>aveo</i> 31 f. 70	<i>custos</i> 74

- deus* 26 f.
dies 26 f.
Diespiter 27. 62
divus 26 f.
domo 25
ego 17
endo 67
esuno Osc. 64
faba 47
facio 46. 50
fauces 46
fax 45
febris 47
fel 46. 50
felo 46
femina 36
fero 47
fertu Umbr. 47
ferus 45
FHEFHAKED 46
fibra 47
filius 34. 36. 46
finġo 44
flos 47
fordus 47
formus 45. 50. 55
fortis 46
fovea 46
foveo 43. 45 f.
fragro 45
frater 47
fufans Osc. 48
fui (perf.) 47
fuma 46
fumus 46
fundo 45 f. 50
garrio 56
gena 37
genitor 25
genuini (dentes) 37
glaber 47
glisco 43 f.
gradior 44
gramen 43 f.
haedus 46
hariotus 46
hasta 74
haurio 44
heri 24
hesternus 24
hibernus 24
hiems 24. 44
hijo Spanish 34
hio 44
hircus 46
holus 46
homo 24
hondra Osc. 44
honores (plur.) 43
hordeum 46
hostis 44. 46
humanus 24
humerus 44
humilis 24
humus 24. 44. 46
in- 50
inferus 47
infimus 47
infra 47
infula 47
jecur 13. 37 f.
jubeo, jussi 47
jugum 14. 26. 68
jus 14. 68
jussus 47
lavo 36. 72
lectus 9. 44
levis 45
liber (adj.) 8
linquo 9
longus 44
lubel 48
lucco 9
lumbus 47
luo 9
magnus 8
margo 7
mater 8
medius 46 f.
mesial Osc. 46 f.
memini 8
meto 7
mihi 44
mille 44
mollis 50
mufrius 46
muger 45
mulgeo 7
mus, mures 8. 43
nato 9
navis 8
ne quidem 8
nebula 8. 47
nemo 24. 44
neo 9
nepos 7
Nero 7
nervus 9
nihil 44
ning(u)it 45
nivit 9
nix, nivis 43. 45
nomen 7
novem 7
novus 8
nox 8
nubo, nupsi, nuptus 43.
 48
nurus 9
occultus 50
os 70
palumbis 63
pipafo Faliscan 48
plenus 35
pono, positus 24
portus 50
prehendo 44
puf Osc. 47
pufe Umbr. 47
purus 36
putus 36
rego 12
ruber 12. 43. 47
rufus 47
runco (subst.) 12
russus 47
serum 24 f.
sitis 24 f.
situs 'place' 24 f.
situs 'rust' 24 f.
spargo 44

stab(u)lum 47
staflatassel Osc. 47
stramen 35
stratus (part.) 35
suffio 46
texo 24

trama 44
ubi 47
umbo 48
ursus 24
veho, vectus 44. 57

venio 50
ventus 6. 66 f.
verbum 6. 47
verruca 7
vidua 46

7. Tocharian.

aknāsa B 75
keⁿ B 69
mācar A 68

mācer^o B 75
šaumo B 25. 68
šom^o A 25. 68

šomiⁿ A 25
lkaⁿ A 69
lkācar A 16. 68

8. Indo-Iranian.

Words without special indication are Sanskrit; the alphabetic order is that of this language. In Avestan and Old Persian words the following rules are observed: after $\bar{a} : \acute{a}$; — $a + e : ae$; — $e : \acute{e}$; — $kh : x$; — $gh : \gamma$; — $th : \theta$; — $\xi : \acute{\xi}$; — $s : z$.

akṣi- 18. 20
axšata- O.Pers. 20
a-γ̃ōnvanma Av. 20
adam O.Pers. 17
anīla- 70
abhiḡñu- 36
arša- Av. 20
avati 31
avitar- 31
aši- Av. 18
asiknī 72
asita- 72
asrk 37–39. 72
azəm Av. 17
aham 16 f. 37
āḡ 70
ilayati 8
ihi 17. 30
ukṣati ‘grows’ 31
ukṣati ‘sprinkles’ 30
ugra- 31
ullara- 30
udan- 30
upa 30
ubhnāti 30
usra- 31
ūtiḡ 31 f.
rkṣa- 20. 22
oman- 31

karmāra- 70
kṛṣati (*karṣati*) 26. 57
Kṛṣṇa- 63
kṣaṇoti 20
kṣatra- 20
kṣamya- 19 f.
kṣayati 20
kṣayaḡ 20
kṣarati 19–21. 25
kṣaḡ 19–21. 25
kṣāyati 22
kṣiṇāti 20
kṣitīḡ (= κτίσις) 20
kṣitīḡ (= φθίσις) 20
kṣeti 20
kṣetra- 20
xirs Mod.Pers. 20
xšaṡra Av. 20
Xšayāršā O.Pers. 20
xšī (gen. xšyō) Av. 20
γ̃zar Av. 20
cyuti- 22
janītar- 25
janīman- 68
janman- 68
jānu- 36
jainti Av. 20 f.
jñu- 36
jharant- Prākṛ. 19. 21

jharā Prākṛ. 19. 21
jhari Prākṛ. 20 f.
takṣan- 20. 24
tašan- Av. 20
tvam 17
damayati 25
divya- 64
dī Mod.Pers. 19
dideti 27
dirḡha- 35
duḡdar Gāthic 16
duhitar- 16. 37
deva- 64
dya- 27. 63
dya(i)- 27. 63
dyuniś- 63
dyupati- 63
dyumna- 63
dyota- 62
dyotate 62. 64
Dyāuḡ 27. 62
drāghman- 35
dhayāmi 36
dhāyu- 36
dhārū 36
dhīta- 36
nak 8
napāl- 7
nabhaḡ 8

nar- 7
nava- 8
navan- 7
nā 8
nātha- 8
nindati 7
nau- 8
paṣate 25
pariman- 68
parīman- 68
Parjanya- 64
paliknī 62, 72
palita- 62, 72
pavate 36
pāvaka- 36
pīta- 36
√pā 36
pūrṇa- 35
prṇāmi 35
pṛthivī 68
pṛthu- 34
prathiman- 68
bhare 71
manyate 8
mazant Av. 16
mahat- 16, 37
mahi 8, 16
mātar- 8
miḥda- Av. 8

mīḍha- 8
mūṣ- 8
yakṛt 37–39
yava- 14, 68
yasyati 14, 68
yākarə Av. 38 f.
yugam 14, 68
yunajmi 14, 68
yūyam 17
yūṣan- 14, 68
raōpi-s Av. 8
rakṣas- 12, 19
raghu 8
rajas- 12, 22
rajyati 12
raśah- Av. 19 f.
riṇakti 8
rudhira- 70
rejati 8
rocate 9
rodhyate 8
rohita- 12
luñcati 12
lunāti 9
lopāsa- 8
vayam 17
Varuṇa- 64
varṣman- 7
vasati 6

vācāla- 70
vāti 6
śakṛt 37–39
śiṛṣan- 56
śudhyati 22
śubhra- 22
śyena- 20 f.
śraddhā- 47
śrayāmi 56
śācīti O.Pers. 20
śīli- Av. 20
śōiṭra- Av. 20
sācna- Av. 20 f.
subhānu- 63
starī- 22
stirṇa- 35, 56
strṇāmi 35
syūman- 30
zam- Av. 19, 21 f.
zarjṇ Ossetic 56
zā Av. 19
zōmaka Av. 19
zyā Av. 19, 21
hanu- 37, 68
hanti 20 f. 55
hima- 19
hemanta- 19
hyaḥ 19, 21, 68

9. Armenian.

alk'al 8
alwēs 8
anicanem 7, 67
anun 7
anurj 22
arbi 11
arj 21 f.
arjn 22
āyr 7
bay 51
cicaṛn 56
çacnum 22
çamak 22
çasnum 22
çin 21 f.
çiw 22

çogay 22
çu 22
erek 12, 22
ergic-uçanem 11
es 17
get 21
inn 7
jet 21
jiwn 21
jmeṛn 21
jukn 21
jern 21
jil 21
jin 21
jur 21
leard 38

lk'anem 8
loys 9
mayr 8
mec 8
mrjmn 22
mukn 8
nor 8
orcām 12
siwn 22
sterj 22
šand 21 f.
šek 21
šen 21 f.
šiw 22
unkn 31
urju 22

10. Balto-Slavonic.

a. Baltic.

Words without special indication are Lithuanian.

<i>ãš</i> 17	<i>láigyti</i> 8	<i>lašyti</i> 23
<i>ausis</i> 31	<i>Paut</i> Lett. 8	<i>vežù</i> 57
<i>auštis</i> 31	<i>lēcziù</i> 8	<i>zuòds</i> Lett. 37
<i>avjnas</i> 31	<i>liáutis</i> 8	<i>žándas</i> 37
<i>awis</i> O.Pruss. 31	<i>liekù</i> 8	<i>žémè</i> 23
<i>dèju</i> Lett. 36	<i>Perkúnas</i> 64	<i>žénklas</i> 56
<i>duktē</i> 16	<i>pìlnas</i> 35	<i>žiemà</i> 23
<i>eš</i> 17	<i>šalis</i> 56	<i>žiemìnis</i> 23
<i>judè'ti</i> 47	<i>šikti</i> 38	<i>žmogùs</i> 23
<i>júostas</i> 14. 68	<i>šliejù</i> 56	<i>žuvìs</i> 23 f.
<i>kēlias</i> 56		

b. Slavonic.

Words without special indication are Old Slavonic.

<i>azũ</i> 17	<i>mati</i> 8	<i>ujĩ</i> 31
<i>golubój</i> Russ. 63	<i>mĩzda</i> 8	<i>velik</i> Russ. 7
<i>golębi</i> Polish 63	<i>pa-męti</i> 8	<i>vranũ</i> 63
<i>jazũ</i> 17	<i>Perunũ</i> 64	<i>zelenũ</i> 63
<i>kũde</i> 47	<i>plũnũ</i> 35	<i>zima</i> 23
<i>ljudĩje</i> 8	<i>pojiti</i> 25. 36	<i>zimĩnĩ</i> 23
<i>lože</i> 9	<i>tesati</i> 23	<i>zlakũ</i> 56
<i>lučĩ</i> 9	<i>ucho</i> 31	

11. Albanese.

<i>ah</i> 23	<i>demĩzε</i> 22	<i>nate</i> 8
<i>arĩ</i> 22 f.	<i>demje</i> 22	<i>peren-dĩ</i> 64
<i>ašt</i> 51	<i>δεmp</i> 23	<i>rit</i> 22
<i>dePe</i> 36	<i>δender</i> 23	<i>sũ</i> 18
<i>dje</i> 22 f.	<i>δimĩzε</i> 22	<i>št</i> 51
<i>djes</i> 23	<i>hε</i> 23	<i>veš</i> 'I dress' 51
<i>de</i> 22 f.	<i>miš</i> 51	<i>veš</i> 'ear' 31
<i>dePpeε</i> 23		

In spite of the constant vigilance of KAJ BARR, NIELS EGE, and NIELS HANSLUND, some inconsistencies of my text have not been purged. One of the worst is perhaps that in simplified transcription the Hittite sibilant is sometimes written *s* and sometimes *š*.