

Indo-European ϑ and Hittite h

For all those who are accustomed to follow Hirt in regarding what is called Indo-European ϑ as the result of the reduction of a long vowel, the conclusion of the present article, far from corresponding to a palpable reality, must appear to be an absurdity. Yet, its starting-point will be de Saussure's fundamental equation $a_1 + A = \bar{A}$ ¹.

Of the two sonantal coefficients, ϱ and A , the former, defined by the formula $a_1 + \varrho = \bar{\varrho}$, will not interest us here. It is a simple equation where x ($= \varrho$) can only have one value. The formula $a_1 + A = \bar{A}$, on the other hand, permits two solutions: $e + \vartheta = \bar{e}$, $e + \vartheta = \bar{a}$. Nothing could be simpler, but no solution could also be more mechanical, than to posit two kinds of ϑ , viz., $\vartheta_1 = \bar{e} - e$, $\vartheta_2 = \bar{a} - e$ ².

These two hypotheses, one concerning the non-vocalic character of ϑ , the other concerning its twofold value (ϑ_1 , ϑ_2), find their sole justification in a morphological consideration – serious enough, it should be added –, viz. the proportion $er : r = \bar{e} : x$. No evidence of a purely phonetic nature has been adduced until now.

In our article *Les effets du ϑ en indo-iranien* (*Prace filologiczne*, vol. XI), we have endeavoured to prove (1) that ϑ_2 ³, lost before a vowel, has induced the aspiration of a preceding voiceless plosive (cf. also de Saussure, *B. S. L.*, meeting of June 6, 1891, *Recueil des p. s.*, p. 603); and (2) that at the end of *set* roots, ϑ makes position together with the preceding consonant if the first syllable has the full grade, so that in

¹ *Recueil des publications scientifiques*, p. 127.

² One can also use the symbol ϑ_3 to denote ϱ . A classical example of the three sonantal coefficients is provided by the three morphologically equivalent Greek verbs $\tau\acute{\iota}\text{-}\theta\eta\text{-}\mu\iota$, $\acute{\iota}\text{-}\sigma\tau\bar{\alpha}\text{-}\mu\iota$, $\delta\acute{\iota}\text{-}\delta\omega\text{-}\mu\iota$. (Cf. Cuny, *Revue de Phonétique* II, 1912, p. 123).

³ The symbol ϑ is used to bring out the consonantal value of ϑ (cf. $\dot{\iota}$, μ).

causatives and in the second member of a *tatpuruṣa* compound the radical vowel of these roots cannot appear as long in Indic. In this respect, a root like *ḡenā* does not differ from a root like *īeug*. (Cf. also Hirt in *I. F.* 32, p. 247.)

If we have taken the liberty of presenting these results without producing the data, it is because we propose to address a different problem here, viz. that of the different kinds of ϑ (ϑ_1 , ϑ_2).

Let us, then, posit in a wholly mechanical way $e + \vartheta_1 = \bar{e}$; $e + \vartheta_2 = \bar{a}$ ⁴. It is hard not to notice a similar phenomenon manifesting itself at the beginning of the word, where a certain kind of *e* acquires an *a*-colouring which dates back to the period of Indo-European unity. By assuming Indo-European words beginning with *e* and *a* to have originally contained the initial sequences $\vartheta_1 e$ and $\vartheta_2 e$ ⁵, we gain a threefold advantage:

(1) the multiplicity of vowels is replaced with a multiplicity of consonants. This is an obvious advantage from the point of view of the theory of apophony, which endeavours to reduce the independence of vowels to a minimum.

(2) from the structural point of view, two roots like *ei* ($=\vartheta_1 ei$) and *kei* become similar. This is an unquestionable advantage for the theory of the root: every root begins with a consonant.

(3) the voicing of final plosives before the initial vowel of the following word (in Indic and in the verbal prefixes of Slavonic) becomes easy to understand if we assume the initial vowel to have been accompanied by a glottal stop (cf. the smooth breathing of Greek and the alliteration of Germanic: E. Meyer in *Sitzungsberichte der Berl. Ak. hist.-phil. Klasse* 1925). The glottal stop is actually but a voiced plosive. This yields an advantage from the point of view of the theory of sandhi:

⁴ In the second case *e* acquired *a*-colouring before contraction.

⁵ In both cases, ϑ is regularly lost before a vowel. The only trace of ϑ_1 is therefore the fact that *e* is not altered, whereas it is changed to *a* by preceding or following ϑ_2 . It is only between a vowel and a consonant that ϑ is absorbed by the vowel and lengthens it. De Saussure posited *A-* instead of *Ae-* (*Mémoire*, p. 276; *Recueil*, p. 258), which is incorrect both from the phonetic and from the morphological point of view.

$-t \ 'e > -d \ 'e$ does not differ from $-t \ g > -d \ g$. At first sight, it seems difficult to provide evidence for the loss of initial consonants in words which, since the earliest texts, have always displayed initial vowels subject to the workings of sandhi, such as elision or contraction. There even seems to be a conclusive argument against a hypothesis of this kind. For it could be objected that, if every Indo-European word began with a consonant, be it only a glottal stop, then a form like Ind. *uṣṭá-* from **vas* 'shine' would have to be regarded as an innovation, since \bar{u} -s and \bar{a} - \bar{u} -s + *tó-* (with glottal stop or another consonantal element) would have been different roots in the ancestor language. But this argument ceases to be compelling if we have a closer look at the roots presenting this type of *samprasāraṇa* (Wackernagel: *Altind. Gr.* I, p. 69 ff.). If, alongside Ind. *a-vasran*, *vavákṣa*, *vádati* we find *ucchāti*, *úkṣati*, *uditá-*, this is because the Indo-European roots are not \bar{u} -s, \bar{u} -g(s), \bar{u} -d but \bar{a} ₂- \bar{u} -s, \bar{a} ₂- \bar{u} -g, \bar{a} ₂- \bar{u} -d (cf., e.g., Lat. *aurōra*, *augeo*, Gk. αὐδῆ). The relationship between Ind. *par-út* (Gk. πέρυσι etc.) and Indo-Eur. **uetos* can be explained by assuming a root **aut*, **uet*, underlying also ἐνι-αυτός. Such roots (as we know thanks to Mr. Hirt, who has brought these facts to prominence) may appear in three shapes: (1) *aús*, *aúg*, *aúd*; (2) *ues*, *ueg*, *ued*; (3) *us*, *ug*, *ud*⁶. In our view, these are the respective reflexes of (1) \bar{a} ₂*eús*, \bar{a} ₂*eúg*, \bar{a} ₂*eúd*; (2) \bar{a} ₂*ues*, \bar{a} ₂*ueg*, \bar{a} ₂*ued*; (3) \bar{a} ₂*us*, \bar{a} ₂*ug*, \bar{a} ₂*ud*. If, for the first and the third series, the result is as we would have expected (loss of the weak phoneme \bar{a} before a vowel), the second, with its \bar{a} supported by a following consonant, could and should, according to the rules of sandhi, reveal the presence of \bar{a} , be it only by the lengthening of the final vowel of the preceding word (according to the formula: vowel + \bar{a} = long vowel). It is hardly astonishing, considering the extreme antiquity of the phenomenon under discussion, that nothing of the kind is observed in the sandhi of the Rigveda. It is only in composition that we have a chance of finding traces of (initial) \bar{a} .

(1) the inflection of *āp*, *apáh* is perfectly comparable to that of *pāt*, *padáh*. The *e* of the root *ped* cannot be dropped, as the cluster *-pd-* would be impossible to pronounce. In composition, however, after

⁶ A fourth shape would be *u_es*, *u_eg*, *u_ed*, cf. the above-mentioned article (§ 19), where *samprasāraṇa* is also discussed.

a preceding vowel, the sequence *p-d* can be divided over two syllables, and so we can have Ind. *upa-b-d-a*, Greek ἐπί-β-δ-αί. In the first syllable of the numeral 'four' we have a reduced vowel that disappears in compounds: Avest. *ā-x-tūirīm*. Similarly, in **ǝ₃ep-*, the loss of *e* would give rise to an unpronounceable cluster *ǝ₃p-*, which can exist only in contexts such as *upabda-*. Thus, *dvīpa-*, *anūpa-*, *abhīpa(taḥ)*, *pratīpa-*, *nīpa-* (in the proper name *nīpāthiti*, attested in the *Rigveda*) go back to **dviǝ₃-pa-*, **anuǝ₃-pa-* etc. In a similar way, the root **ok[#]* 'eye' is contained in **eniǝ₃-k[#]o-* (*ānīka-*, cf. Greek ἐνωπή) and enters, as noted by J. Schmidt, a number of compounds such as *āpāka-*, *abhīka-*, *ūpāka-*, *prātīka-*, *nīcā-*, *prācā-* etc.⁷ *avāyatī* (part. fem. of *ava + i*), attested in *R. V. VIII, 91, 1*, where *ā* is guaranteed by the metre, is regular: **avaǝ₁intī*. Similarly, *āsat-* 'non-existent' (5 times in the *Rigveda*) can be explained as **a-ǝ₁s-nt-* (from the root *ǝ₁es*). The imperfect dual and plural of the same root show an *ā* which can be explained only as *a + ǝ₁*. The *i* of the preposition *abhi* is lengthened in two instances before the participle *sat*: *abhi satāḥ* (VII, 32, 24) and *abhi śat* (II, 41, 10). Cf. also *ānaṭ* from the root *naś* (*qś*). It would certainly be impossible to regard all these long vowels as inorganic. Yet it is equally impossible to regard them as resulting from the contraction of *e* and *e*.

For how could we imagine the reduced vowel that could have lengthened preceding *i* or *u* in compounds? As far as we know, *e* in *p_ed-* was sufficiently close in quality to a central vowel to be represented by *a* in most Indo-European languages (*e* in Lat. *pedis* etc. being due to analogy). We would not therefore expect anything else than **anyaka* (instead of *anīka*) or **anvaka* (instead of *anūka*), as *i* and *u* could not have retained their syllabic value before a central vowel. To regard *ā* in *āpāḥ* (nom. pl.), as opposed to gen. sg. *apāḥ* etc., as an original long vowel would be to accept the same for *pāt* and many other root nouns (such as *vāk* etc.). This can be adduced against Güntert, *Ablautsprobleme*, p. 6 and 134.

⁷ *Pluralbildungen der indogermanischen Neutra*, p. 388 ff. – The forms with nasals, on the other hand, go back to a root **ǝ-n-k[#]* (cf. Greek ἀλλοδαπός, Lat. *propinquus* etc.).

Those who do not believe in the consonantal character of *a* do not have the right to invoke the parallelism between $e + e = \bar{e}$ and $e + a = \bar{e}$, as, for them, the latter equation would have no phonetic reality: it would be, at best, a morphological reality ($\bar{e} : a = er : r$). For them, *a* is only a weakening of \bar{e} , an originally long vowel.

In a similar fashion, the root *vas* 'clothe' (< **eus*, i. e., * $\text{æ}_1\text{-u-s}$, cf. Avest. *aoθrəm* etc.) yields, in the *Rigveda*, a compound *adhī-vāsā-* (3 times) and a perfect middle participle *vā-vasāná-* (2 times). The root *vas* 'dwell, spend the night' (< **aús*, i. e., * $\text{æ}_2\text{-u-s}$) has an identical perfect middle participle. The adjective *vasu-* 'good', which the Gothic comparative *iusiza* 'better' entitles us to classify with the type we are here dealing with, always lengthens the final vowel of the first member of a compound (s. Grassmann, *Wörterbuch z. Rigveda*, index, and Arnold, *Vedic metre*, p. 125).

(2) However one chooses to explain the following two series of facts:

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|---|---|
| (a) <i>tanákti</i> – <i>tvanákti</i>
<i>tákṣati</i> – <i>tvákṣati</i>
<i>ṣaṣ</i> – Avest. <i>xšvaš</i>
<i>se-</i> – <i>sue-</i> (Solmsen, <i>Untersuchungen</i> , p. 200–203), | (b) <i>āñcati</i> – <i>vāñcati</i>
<i>árṣati</i> – <i>várṣati</i>
<i>ṛdhāti</i> – <i>várdhati</i> |
|---|---|

it is clear that we gain a certain advantage by explaining them in a similar fashion. If we posit *añc* = $\text{æ}_2\text{enk}^u$ and *vañc* = $\text{æ}_2\text{uenk}^u$, series (b) will be exactly parallel to series (a), but we will still be under the obligation to prove the existence of the sequence $\text{æ}_2\text{u-}$. Now in the *Rigveda* the root *vṛdh*, used as the second member of a compound, lengthens the preceding vowel in *ṛtā-vṛdh-* (33 occurrences), *tugryā-vṛdh-* (3 occ.), *parvatā-vṛdh-*, *ghṛtā-vṛdh-*, *annā-vṛdh-*, *āhutī-vṛdh-*, *ṛdū-vṛdh-*. The two other roots yield *prā-vṛṣ-*, *prā-vṛṣṇa-*, *vāvṛṣāná-* (3 occ.); *vāvakré*. Neither the counterexamples nor the spellings of the *Padapāṭha* can be used as counterevidence, because they only reflect the natural tendency to restore the normal shape of the first member. The root *rudh* (*ruh*), basically identical to *vṛdh*, similarly presents *anū-rudh-*, *vī-rudh-* (12 occ.), *upā-rúh-*, *gartā-rúh-*. If Lith. *ritù* is to *verčiù* (< **vertiō*, for an earlier **vertō*) as Ind. *ṛdhāti* is to *várdhati*, as seems indeed to be the case, then we can explain several problems at one stroke:

(a) the identity of meaning between the two roots; cf., e. g., Avest. *vāša-* (= *varta-*) = *raša*; *Rigveda* I, 183, 2: *suvṛd rátho vartate*.

(b) the coincidence of the areas of expansion of both roots (**ret* and **uert*). Both are attested in Indo-Iranian, Italo-Celtic, Germanic and Balto-Slavonic. Both are lacking in Armenian and Greek. (*rata-* is certainly Balto-Slavonic, cf. Trautmann *s. v.*, even though it is not attested in Slavonic⁸). – The only, rather uncertain trace of **uert* in Greek would be Hesychius' gloss *ράτάναν* (and *βράτάναν*) 'ladle'.

(c) the frequency with which *-vṛt* lengthens, in the *Rigveda*, the vowel of the first member of a compound. Cf. *abhī-vartā-* (2 occ.), *dakṣinā-vṛt-*, *ánapā-vṛt-* (2 occ.), *hrādunī-vṛt-*, *viṣū-vṛt-* (2 occ.), perfect *vāvart-*, *vāvṛt-* (11 occ.).

If, on the other hand, one chooses to cling to the current doctrine according to which **uert* is an expanded form of **uer*, in the same way as **uerg*^(u) and other roots, it becomes impossible to explain the causes underlying the lengthening induced by **uert*; instead, one will be able to account for the similarities between **uert-* and **uerg*^(u); for the latter root induces lengthening as well: *prāvargá-*, *suprāvargá-*, *ápāvrkta-*, *vāvrje*, *āvṛṇak* (with lengthened augment; 4 occurrences).

If, as generally assumed, Ind. *vṛnóti* partly corresponds to Lat. *volvo* etc., the tendency for the Indic root to lengthen a preceding vowel is justified. As Persson correctly observed, we must start from "a base **euel* (or **auel*?)", cf. *Beiträge z. ind. Wf.* 1, p. 541. – In the *Rigveda*, we find *ápāvr̥ti-*, *prāvṛta-* (2 occ.), *áparivṛta-*, *ápāvr̥ta-*, *ápivṛta-* (4 occ.), *pārivṛta-* (6 occ.), *abhīvr̥ta-* (8 occ.), *ávāvarīt* (pluperfect), *āvar* (lengthening of the augment; 19 occ.). In 5 instances, the verbal prefix *ápa* displays *ā* before the imperative *vṛdhi*.

Let us note, finally, that the root *vaś* 'wish, desire' always shows the reduplication syllable *vā* in the perfect (15 occ.). Now this root shows *samprasāraṇa* in *uśānti* etc. The lengthened augment in *āvidhyat*

⁸ The Indo-Iranian *th* arose through thematicisation of a stem **rotā* m. (*ā* = *e* + *ǵ₂*; **rótǵ₂o* > **rótho*), morphologically similar to *pánthāh* and *sákhā* (the aspirates originate in the oblique cases). The original masculine gender follows from a comparison of Lat. *rota* (which preserved the stem) and Old Irish *roth* (which preserved the gender). In a similar fashion, the opposition of Ind. *bhūrja-* (m.) and OChSl. *brěza* (f.) attests to an original feminine *o*-stem.

(*vidh* < *vi* + *dh*) can be explained only on the assumption that *vi* is related to *u* in *ubháu* (s. Walde² s. v. *viginti*). The parallelism of *tanakti* | *tvanakti* and *arṣati* | *vārṣati* cannot be maintained without accepting the existence of an initial consonant in *árṣati*.

One could object that, as all the instances discussed here involve the sonant *u*, the lengthening of the vowel could be due to a following *u*. To this we can reply: (1) that nothing similar is observed in word-internal position; (2) that the lengthening in question occurs only in the case of certain particular roots; (3) that there are not only roots beginning with *u* which do not show this lengthening at all, but (4) there are also roots beginning with other consonants which do show it. Cf., e. g., Whitney's *Indische Grammatik*, p. 274, where the roots presenting lengthened reduplication syllables are listed (8 roots out of 27 have initial *u*), and p. 214, with a list of roots showing lengthened augment (4 roots out of 7 have *u*-). And our thesis can be illustrated with examples like *akṣā-nah-*, *parī-nah-*, which can be explained if we follow Mr. Wackernagel (*Altind. Gramm.*, p. 250) in deriving *nah-* from **negh-* rather than from **nedh* (the current opinion, endorsed by Walde s. v. *necto*), for in that case another shape of the root *añh* would be involved here. A perfect like *rāraṇa* (1st pers.; **raṇ*) finds its justification in Avest. *armaē-šad-*, *armaē-štā-*, *airime*, the roots *ram* and *ran* being cognate. – In order to account for *abhīnaḥ* (3 occ.) we must think of the *saṁprasāraṇa* represented by *asmākam* etc. – The consistent lengthening observed before *-magha-* as a second member of compounds (*śatāmagha-*, 4 occ.; *śrutāmagha-*; *citrāmagha-*, 4 occ.; *sahāsrāmagha-*; *āsvāmagha-*; *tuvīmagha-*, 11 occ.) could be explained if *amhitiḥ*, *amhitī* 'gift, present' were related to *maghām* 'gift, present' and *maṁhate* 'makes a gift of...', but the palatal in Arm. *əncay*, *ənjay* seems to contradict this⁹.

As for the consistent lengthening of short vowels before the suffix *van-*, cf. *l. c.*, § 11. In most of the cases, it is impossible to point out the motivation underlying the length of the vowel, i. e., to prove that the root once began with *ə-*, but it would be equally impossible to disprove

⁹ Fr. Müller (*W. Z. K. M.* 10, 182) compared *amhitiḥ* to Armenian *aužit*, but Arm. *t* goes back to Indo-European *d* (cf. Hübschmann: *Armenische Grammatik*, p. 448).

it. We may assume, with little risk of error, that part of the cases are merely due to analogy. The right to choose between a phonetically regular and a morphologically regular form was certainly appreciated by the poets of the *Rigveda*, and they did not fail to exercise it even beyond its proper limits.

We have here one of the sources from which what is commonly referred to as "metrical lengthening" could have sprung.

The question of initial ϑ having been answered in the affirmative, another question immediately arises: were ϑ_1 and ϑ_2 originally both glottal stops? What was, then, the reason for their different behaviour with regard to a vowel that followed them?

This question would be unsolvable in the present state of comparative grammar if, by an almost unbelievable coincidence, Hittite did not seem to have preserved the consonantal character of ϑ_2 . We are referring to the sound denoted h . We have only to compare the following examples¹⁰:

(1) in initial position:

Hitt. *hantezzi* 'first': Lat. *ante*, Arm. *andrank*, Gk. ἀντί. -zzi- is a well-known Hittite suffix, cf. *šarazzi* 'upper' etc.

Hitt. *henkan*, *hinkan*, *hingan* 'death': **ank*, s. Walde s. v. *neco*, Boisacq s. v. ἀνάγκη; Bret. *ankou*, Gaul. *angeu* 'death'.

Hitt. *hūiš(u)* 'live'. Indo-European root **a- μ -s* (*aus*, *ues*). Skrt. *vásati* 'dwell, spend the night', Gk. ἰαύω 'spend the night', OHG *wesan* 'be', Arm. *goy* 'exists'; as for -iš < -es cf. *nebiš* < **nebhes*.

Hitt. *hark* 'shine' in *harkiš* 'white, shining' (Z. f. Assyriologie 37, p. 184): Greek ἀργής 'bright', Ind. *árjuna-* etc.

Another comparison that seems compelling at first sight is that between Hitt. *hamešhanza* 'spring, summer' (Sommer, *Hethitisches*, p. 20, with references) and Ind. *vasantá-*, cf. also Hitt. *gimanza* 'winter' and Ind. *hemantá-*. But in order to make this plausible we would have to accept two assumptions which are purely hypothetical:

¹⁰ Unless otherwise stated, the meanings assumed here for the Hittite words are those given by Mr. Sommer in his glossary to the text *Das hethitische Ritual des Pāpanikri von Komana* (Boghazköi-Studien X).

- (a) the writing *ham* stand for *hm* (this assumption is acceptable considering the character of the cuneiform script);
- (b) *hm* was substituted for *hw-* through assimilation to the *n* of the suffix or to the *m* of *gimanza*.

Even then, the second *h* would remain without explanation. The root underlying *vasantá-* is *a- \underline{u} -s* (*a₂- \underline{u} -s*) 'shine' (cf. Uhlenbeck s.v.).

(2) root-internally and root-finally:

Hitt. *išhiia* 'bind' (*i* is prothetic): Indo-European **sāi* (*s-a₂-i*), cf. Walde s. v. *saeta*.

Hitt. *šuhh* (and *išhuwwa* with prothetic *i*) 'throw, launch, pour, stack': Indo-Eur. **s- \underline{u} -a₂* in Ind. *suvāti sūté* (*savitár-*) etc., *a₂* being confirmed by Avestan **hunāmi*¹¹.

Hitt. *pahš* 'guard': Lat. *pāscor* < *pā(s)* + *scor* (*pā* = **pe₂*), *pāstor*. We surmise that **pā-* 'pasture, feed' and **pō* 'keep' are basically one and the same root, the alternation *ā/ō* being regular ($\varphi\eta\mu\acute{\iota}$, $\varphi\omega\nu\acute{\eta}$) and the meanings being closely connected, as in the case of Slavonic **xorniti* (e. g., Serbo-Croatian *hrániti* 'feed, guard').

Hitt. *wah-nu-* (and *weh*¹²) 'turn, twist': Indo-Eur. root **uā-* (< **ue₂*) 'bend' (cf. Walde s. v. *vārus*).

Hitt. *pahhur* 'fire' = **pe₂-ur*, cf. Goth. *fōn* < *pā-un* (-*uer* and -*uen* alternating within the paradigm in question). Cf. Cypriotic $\pi\acute{\alpha}\iota\omega$ 'burn' < **παφεσ-ιω* (Boisacq s. v. $\pi\acute{\alpha}\iota\omega$).

Hitt. *mahlaš* 'apple': Gk. $\mu\tilde{\alpha}\lambda\omicron\nu$ is interesting even though the word is not Indo-European (A. Götze, *Heidelberger Jahrbücher* 1925).

As the final consonant of a root, *i* often occurs after a nasal or a liquid (cf. Hrozný, *Die Sprache der Hethiter*, p. 177: die *h*-Stämme). Cf. Hitt. *šanh* 'petere, quaerere' (Sommer, *Heth.* II, p. 45–56), Ind.

¹¹ As Mr. Meillet has shown (*Mélanges Vendryes* 1925, p. 275 ff.), *nā* in Indic verbs of the 9th class goes back to Indo-European *nā* in all archaic forms.

¹² Cf. Sommer, *Hethitisches* (*Boghazköi-Studien* IV), p. 2–12, *Hethitisches* II (*Boghazköi-Studien* VII), p. 40, fn 1. The former stem is transitive, the latter intransitive.

sani- 'acquirere', Cretan ἄναμαι; Hitt. *tarh* 'vanquish, tame, slay'¹³, Ind. *tárati*, *tiráti* (*ava*, *nis*, *ā*), Lat. *in-trā-re*.

h being a highly productive suffix, it is used to derive denominative verbs, e. g., Hitt. *idāluš* 'bad', *idālauwahmi* 'I do wrong', *daššuš* 'violent, powerful', *dašuwahhi*¹⁴ 'he violates, harms'. Cf. the Indo-European verbal suffix *-ā-* (Lat. Gk. *-ā-* [+*iō*], Celtic *-ā-*, Germ. *-o-*, Slavonic *-a-* [+*iō*], Lith. *-o-* [+*iō*]). Cf. J. Friedrich in *Zeitschrift für Assyriologie* 35 (N. F. 1), p. 16–17.

(3) The verbal endings of the singular appear in a twofold shape in Hittite:

(a) *-mi*, *-ši*, *-zi* (= **-mi*, **-si*, **-ti*);

(b) *-hi*¹⁵, *-ti*, *-i*.

If we drop, in the second series, the *i* which is proper to the present, we get *-h*, **-th*, *-zero*. We are entitled to reconstruct *th* by the fact that (1) the Indo-European languages show many 2nd person endings beginning with *th-* (cf. Ind. *-thās*, *-tha*), but not a single one beginning with *t-*; and (2) an original *t* would have been changed to *z* before a following *i* (cf. the 3rd person singular ending *-zi* < **-ti* and Mr. Kretschmer's remark in Hrozný, *Die Sprache der Hethiter*, p. 161, fn. 1).

If, in the endings *-a*, *-tha*, *-e* of the singular of the Indo-European perfect, we subtract the final *-e*, while at the same time restoring to *a* its proper value, viz. *æ₂e*, we obtain *-æ₂*, *-th* (i. e., **tæ₂*, cf. the above observations concerning the aspiration of voiceless stops), *-zero*. The second series of Hittite endings is thus basically identical to that of the Indo-European perfect; this is a parallelism we should not disregard. The difference is that in Hittite the endings have been expanded with *-i* in the present, whereas the Indo-European perfect takes on *-e*. It is known that the Indo-European perfect is basically but a present with special endings (cf. Hirt, *Handbuch der gr. Laut- u. Formenl.*, p. 567; Renou, *Valeur du parfait dans les hymnes védiques*, p. 7 ff.).

¹³ Cf., e. g., Sommer, *Hethitisches (Boghazköi-Studien IV)*, p. 19, 20, 21.

¹⁴ These two examples are taken from Mr. Hrozný's glossary (in *Die Sprache der Hethiter*).

¹⁵ The *h* of the 1st person is also found in the imperfect (*-hun*) and in the middle (*-hari*, *-hat*).

At a stroke, we gain a new insight into two difficult questions of Indic phonetics: (1) the reason for the occurrence of *-th-*; (2) the opposition between the 1st pers. (*cakara*) and the 3rd person (*cakāra*): this is actually an opposition between a closed syllable ($*q^{\#}q^{\#}or\vartheta-e$) and an open syllable ($*q^{\#}q^{\#}or-e$).

That the second series of endings must originally have been used in the present can be seen from the fact that Ind. *-e* (the ending of the perfect middle 3rd pers. sg.), composed of *zero* + *ai*, is vestigially found also in the present¹⁶. – There can be no doubt either that the 1st person ending is identical to that which we find in the thematic inflection: $*bhero-\vartheta_2 > *bher\bar{o}$. Similarly, the Indo-Iranian 1st pers. sg. middle ending $*-ai$ is just $*-\vartheta_2ai$ ($< \vartheta_2 + ai$), as opposed to Greek $-\mu\alpha\iota$ ($< m + ai$). The 3rd person middle imperative ending $-\bar{a}m$ (found in *duhām*, *vidām*, *śayām*; Whitney, *Altind. Gramm.*, p. 229) is to $-\bar{t}ām$ as $-\bar{t}i$ or $-\bar{t}e$ is to $-e$. The zero ending of the 3rd person, expanded with the present marker $-i$ (whence simply *i*) is still preserved in Greek: $\phi\acute{\epsilon}\rho\epsilon\iota < \phi\acute{\epsilon}\rho\epsilon-$ (theme) + *i*; the acute of $\tau\acute{\eta}\kappa\epsilon\iota$ etc. shows that $\epsilon\iota$ has arisen from contraction. Finally, $-\bar{t}h\bar{a}h$ in the 2nd pers. sg. of the imperfect is certainly related to $-\bar{t}ha$.

(4) It remains to be proved that ϑ_1 , defined by the formulae $\vartheta_1e = e$; $e\vartheta_1 = \bar{e}$, is never represented by h in Hittite: *eš* 'be' (Indo-Eur. $*es$); *eš* 'sit down' (Indo-Eur. $*\bar{e}s$); *ed*, *ad* 'eat' (Indo-Eur. $*\bar{e}d$); $-a-$, enclitic 3rd pers. pronoun (Indo-Eur. $*e$); *anda(n)* 'inside' (Gk. $\acute{\epsilon}\nu\delta\omicron\nu$); *ar* 'come, arrive' (causative *arnumi* 'I bring'), Indo-Eur. $*er$ in Lat. *erro*, Skr. $\bar{r}n\acute{o}ti$, $\bar{r}cch\acute{a}ti$ etc.; *apiia* 'there' ($\acute{\epsilon}\pi\acute{\iota}$); *dā* 'put' (Indo-Eur. $*dh\bar{e}$); *it* 'go! (sg.)', *itten* 'go! (pl.)' (Indo-Eur. $*ei$; Hrozný, Glossary); *aššuš* 'good' (Gk. $\acute{\epsilon}\acute{\upsilon}\varsigma$, J. Friedrich in *I. F.* XLI, p. 370 ff.); *lā* 'unbind', *ibid.*, p. 374 (Indo-Eur. $*l\bar{e}$ 'let'); *arraš* 'anus' (Indo-Eur. $*ers$: OIr. *err*, Gk. $\acute{\omicron}\rho\pi\omicron\varsigma$, OHG. *ars*); *ug(g)a* (Gk. $\acute{\epsilon}\gamma\omega$ etc. Hrozný, *Die Spr. d. H.* p. 97); *veš* 'clothe' shows that it is correct to posit *eu* (cf. Walde, Boisacq s. *v. vestis*, $\acute{\epsilon}\nu\nu\omicron\mu\iota$), *pace* Persson (*Beitr.* II, p. 650, fn. 2).

¹⁶ Cf. Whitney: *Altind. Gramm.*, p. 200 (§ 545). – The basic unity of the present and the perfect is revealed by the preteritopresents $*u\acute{o}ida$, $*o\acute{i}ka$ (in Ind. $\bar{i}śe$ we have, at the same time, a zero ending and a trace of reduplication: $i-i$) etc.

Notes: 1. Even though cuneiform spelling cannot be said to be based on rigorous principles, the quality and the quantity of the vowels being often uncertain and voiced and unvoiced consonants being often confused, one fact appears certain: all sounds found in the phonemic system reflected by this orthography, with one single exception, are familiar to every Indo-Europeanist. It is almost the Indo-European phonetic system itself, just without its aspirates. The one exception is the sound *h*, which is both frequent and highly stable. It could not fail to attract the attention of scholars from the very start; but the endeavours of Mr. Weidner (*Studien zur hethitischen Sprachwissenschaft*, p. 25 ff.) and those of Mr. Hrozný (*Die Sprache der Hethiter*, p. 290 with references) cannot be viewed as successful (Sommer, *Hethitisches* [B.-St. IV], p. 23, *Hethitisches* II [B.-St. VII], p. 45–46).

2. The counterpart to the lengthening of a final vowel before an initial group *ʔ* + consonant is the vocalisation of this *ʔ* after a final consonant: cf. the Greek prothesis before *r*, *l*, *m*, *n*, *v*, e. g. *ἑίκοσι*, *εἴση* and *vi* in *vyadh*, *ἑέρση* and the lengthening before *varʃ*, *ἄεμμα* and *adhīvāsá-*, *vāvasānā-*, *ἐλευθερός* and the lengthening before *-rudh*, *-ruh*, *ἑρείκω* and *āriṣṭa-* (with privative *a*!), *ἐλαφρός*, *ἐλαχύς*, *ὀρέγω* and the *saṁprasāraṇa* in *ṛhát* and *ṛñjáti*. (Cf. our article *Origine indoeuropéenne du redoublement attique*, *Eos* XXX, 1927.)

Lwów, July 1926