

**FURTHER CONSIDERATIONS ON THE PHONETICS
AND MORPHOLOGIZATIONS OF H^l AND H^u
IN INDOEUROPEAN**

The author puts up to date his ideas on Indoeuropean Laryngeals, which have been published from 1956 onwards. He takes into account new materials as well as new proposals about the most difficult points. He starts exposing some General Phonetics facts which favor his theory and then he offers some new evidence from Anatolian languages which enlarge our knowledge of Indoeuropean Laryngeals. Then he explains minutely the different treatments of Laryngeals in Postanatolian Indoeuropean, arriving frequently to more economical and simple solutions. The paper ends with a synopsis of the treatments of the six Laryngeals (three with a palatal appendix and three with a labial one) in Indoeuropean.

**I. THE THEORY OF LARYNGEALS WITH A PALATAL OR LABIAL
APPENDIX**

In 1961 my *Estudios sobre las laringales indoeuropeas* appeared, in which I postulated the existence in IE of three laryngeals with a palatal appendix (H^l_1 , H^l_2 , and H^l_3 , the respective timbres of which were *e*, *a* and *o*) and three with a labial one (H^u_1 , H^u_2 , and H^u_3 , also with the same timbres). These were to my mind all the existing laryngeals, in contrast to other theories which postulated one or several laryngeals with no appendix, or one palatal laryngeal and/or one labial laryngeal plus several others without appendix. In the above-mentioned book (which, as far as the laryngeals with labial appendix are concerned, had as forerunner a previous article, Adrados 1956), I put forward a whole theory in relation to the phonetic evolution of these laryngeals. At the same time, I studied the morphologization of these laryngeals and their diverse phonetic results, according to vowel gradation, timbre and appendixes, syllabic boundary, etc. Elements such *-ē*, *-ā*, *-ī*, *-ū* and others coming from laryngeals turned out to be radical in origin. They

later became characteristic of several morphological categories and functions of the noun and verb.

A second edition of the book, which appeared in 1973 under the title *Estudios sobre las sonantes y laringales indoeuropeas*, modified certain details and included previous papers on the resonants and other later ones on the resonants and the laryngeals. It was an attempt to solve the problems left pending in the first edition and to organize the whole more coherently. It was also in response to certain critical opinions expressed on the book in the meantime¹. However, as early as 1963, my work *Evolución y estructura del verbo indoeuropeo* (2nd. ed. 1974, with a series of extra papers published later), offered a further analysis of the application of laryngeals with appendix to the study of the evolution of IE verbal morphology from a non-inflexional stage through a monothematic one and then to a polythematic one. My former pupil, Dr. Francisco Villar, carried out a similar study in his book *Origen de la flexión nominal indoeuropea* (1974). It should be borne in mind that these books did not focus on the question of the laryngeals and that these were merely an aid within the more complex subject of the origin of IE inflexion. On the strength of these two books and a few other papers (such as an unpublished doctoral thesis by Dr. Julia Mendoza on the origin of pronominal inflexion), I published my *Lingüística indoeuropea* in 1975. This book, unlike the others, was written as a manual and therefore has no quotations or bibliography, but is based on the arguments of the former books which in turn were based on a study of existing bibliography. The same theory also underlies the etymologies in the *DGE* (*Diccionario Griego-Español*, published by the Spanish «Consejo Superior de Investigaciones Científicas»).

Nevertheless, these books on morphology did nothing to advance the laryngeal theory further than that they contributed a wide range of examples of the evolution of the laryngeals and also demonstrated the usefulness of the doctrine in explaining, with a maximum economy and simplicity, the genesis of IE inflexional systems subsequently developed. This appeared to be one more argument in favour of the same theory; however, it is an argument that has up to now been somewhat neglected by reviewers. It is indeed true that only during the past few years have similar conceptions to mine on the evolution of IE morphology become accepted. I refer to my forthcoming article:

¹ In reply to the most virulent criticism of my book, I said (Adrados 1964: p. 149): «Non dubito che, nella forma da me data alla teoria o in un'altra più o meno vicina ad essa, finirà con farsi strata attraverso il muro delle ironie e degli anatemi». I now have less doubt about this than ever.

«The Archaic Structure of Hittite: the crux of the Problem», as well as Adrados 1979.

Phonetic theory, strictly speaking, has not on the other hand been approached by me since 1961, except for a few articles collected, as I have mentioned above, in the second edition of *Laringales*. Certain other papers should be added which are rather explanations and defences of the theory than new studies or improvements on same. Above all, there is an article by Dr. Alberto Bernabé (1976 and 1977) and another of mine (forthcoming) entitled «More on the Laringeals with labial and palatal Appendixes». In these articles, criticisms of the theory are reviewed, as likewise the contributions of several authors on the subject of the laryngeals and alternative explanations (on the basis of *-u*, *-i* lengthenings or else phonetic ones) of the facts which I attempted to explain by my theory. The conclusion is that this latter, although open to improvements and developments, is by far the simplest and most economical. I would insist, however, that there are hardly any new contributions to it. Some, made by Dr. Bernabé in his doctoral thesis on the laryngeals of Hittite, are still unpublished.

It would seem, therefore, that the moment has come to study the extent to which my laryngeal theory—which reconstructs six laryngeals, all with appendix, and the validity of which I am still absolutely convinced of in its fundamental points—is supported by new data or interpretations and to what extent it should be clearly defined or rectified in certain points which were left doubtful. I am not going to review modern bibliography on laryngeals, which I have already done in my above-mentioned article. I feel obliged, however, to state that this is the right moment, not only on account of the lapse of time, but also because of the new atmosphere to be breathed in the field of IE Linguistics which I also mention in my article. Contrary to the current of ideas of twenty years ago, laryngeal theory is today accepted by practically all linguists in one formulation or another. Again, contrary to the ideas of the fifties, the theory of a staggered development of IE verbal nominal inflexion, to which Anatolian bears witness of an especially old stage, is becoming accepted by more and more linguists. Moreover, as I stated above, internal or comparative reconstruction on a morphological basis is the first instrument for re-tracing the evolution of the laryngeals.

I am therefore going to deal here with the six laryngeals H^1 , H^2 , H^3 , H^u_1 , H^u_2 , H^u_3 . To avoid confusions (which have arisen on occasion and which perhaps were brought about by the organization of my book), I would state that in our theory (and when I say «our», I include

those of my pupils, both quoted here and elsewhere who have applied it), these six laryngeals are all the existing ones. When we write H^1 , we cover in this sign the three laryngeals H^1_1, H^1_2, H^1_3 , in those cases in which timbre is unknown or irrelevant. When we write H^u , we likewise mean the three labial laryngeals. On the other hand, H_1 denotes one of the laryngeals H^1_1 or H^u_1 when the appendix is unknown or irrelevant to evolution, and thus likewise H_2 and H_3 . H will naturally be used to denote any laryngeal when neither timbre nor appendix are known or relevant. To my mind, this is therefore a practical and economical system: it should not however lead to erroneous conclusions.

The book in which the theory is expounded, my *Estudios sobre las laringales indoeuropeas* (1961), has been the object of criticism, above all from the point of view that, according to certain reviewers, it left a wide margin of arbitrariness in the phonetic evolution of the laryngeals. This led to several reactions, from the outright refusal to take the theory into consideration to a request (which was logical) for explanations or specifications, or to the proposal of alternative solutions on the basis of $-u$ and $-i$ lengthenings².

If truth have it, and if I am to be fair, I cannot evade a certain responsibility with respect to these criticisms. My book of 1961 did not elaborate the theory in a clearly defined manner: the were moot points in it, some of which were more fully dealt with in the 1973 edition or which will be the object of study in the present article. On the other hand, it is not surprising that these points should follow the first formulation of such a complex theory. There is more however. It was a mistake (corrected in the 1973 edition) to include the theory of the resonants in an extremely summary way, for this is a theory based on identical phonetic principles to that of the laryngeals and therefore serves as support to this latter. It was also an expositive mistake (impossible to rectify in 1973) to study the «Treatments of the laryngeals independent of labial and palatal appendixes» and the «Treatments depending on labial and palatal appendixes» in two separate parts. If the worst came to the worst, the hasty reader (and more than one reviewer came under this heading) thought that there were laryngeals with and without appendixes. At best, it was thought that there was an irrational multiplicity of phonetic evolutions for the

² For these criticisms, which I have no intention of discussing here, I refer to several papers included in Adrados 1974, to the above-mentioned paper by Adrados 1964, to Villar 1970 and to my forthcoming article «More on the Laryngeals with labial and palatal Appendixes». In this latter I also refer to certain criticisms, which I consider unsustainable, based on arguments of a phonological nature (cf. Adrados 1967, also on this).

same phonemes, which was, nevertheless, far removed from my approach.

Above all, however, the greatest obstacle to a dispassionate study of my theory were certain phrases in the prologue, such as «the neogrammatical concept of the phonetic law cannot be applied to our material». This has on occasion been interpreted as a proclamation of pure arbitrariness in evolution, a return to St. Isidore. A more attentive reading of the prologue and of the book as a whole might have justified my statement that many phonetic laws are the result of secondary regularizations which at times preserve some traces of older stages. This is not at all heterodox but a fact wellknown by any experienced historical linguist. It would also have shown that I was really postulating a type of «irregularity within regularity». The different timbres of resonant and laryngeal vocalization are due to the influence of phonemes in contact. Sometimes, they are preserved but more frequently the tendencies towards a single regular timbre have prevailed. The lost aspirates IE *H* and Hit. *h* may have been in a state of flux for a certain time (whether there is loss, preservation, etymological or pseudo-etymological re-introduction, lexical or morphological usage of preservation or loss). This is a common experience. Equally common is the displacement of syllabic boundaries in the proximity of resonants and, I would add, of laryngeals. The gemination of resonants, occlusives and also laryngeals, at least in Hittite, in which *h* and *hh* alternate, is not a question of theory but is to be seen in the extant texts.

I certainly tried to explain all this in several papers included in the 1973 edition of *Laringales* and above all in two theoretical studies: «Loi phonétique, sonantes et laryngales» (1963) and «Loi phonétique, phonologie et sonantes indoeuropéennes» (1967). These papers doubtless came too late in the day. Out-and-out defence of phonetic law (I only really attacked a certain conception of same), considered as a necessary defensive shield to guard science against arbitrariness, led some to shut their eyes to both theory and facts: I shall refer only to Dr. Villar's paper «L'immobilisme et le problème du verbe indoeuropéen» (1970).

I shall not insist here on the defence of my laryngeal theory from the point of view of General Linguistics. I shall restrict my references to the above-mentioned bibliography and would merely ask for a more painstaking reading of both my books and the following pages. What I wish to demonstrate, however, is that the «irregularities» related to vocalizations, loss and gemination of aspirates and displacements of

syllabic boundaries, have little by little become acknowledged. The parallel between the evolution of the resonants and the labiovelars on the one hand, and the laryngeals on the other, is becoming clearer and clearer. On the other hand, with regard to the real irregularities which may be left after this, I believe that valid solutions may be attempted. This is what this article sets out to achieve.

In order to pass on quickly and to give a few examples, I shall first of all deal with displacements of syllabic boundaries, which, among other things, I have used to explain phonetic solutions of the type *ei* from $e-H^1$ (as opposed to solutions $\bar{e}i$, $\bar{a}i$, $\bar{o}i$, from eH^1 , all of which are solutions before consonants with vocalization of H^1 ; before vowels there are e_i , \bar{e}_i , \bar{a}_i , \bar{o}_i). Now, they speak of $e-Hi$, eHi , but the position of linguists such as Szemerényi (1956:173) and Mayrhofer (1964 : p. 177) in explaining certain oppositions of this type (*ei/ēi*, etc.) is similar to my own. Schmalstieg's (1973 : p. 111 ff.) is identical when he explains O. I. *rayí / rāyé* from $-oyi-$ / $-oyyi-$. I advocate that eH^2 gives $\bar{a}i$ through eHH^2 . As for the results $H^1V > i_iV$ and $H^*V > u_iV$, nobody who knows the evolution of the resonants would be in the least surprised by them. I shall return to these later.

What may be said of the vocalizations? I shall likewise return to them later. I should however like to point out here that what I stated in 1958 and was then considered to be an outlandish hypothesis, is today a commonly accepted fact. I stated that in non-Aeolic Greek, there were vocalizations with *o* and, still, with *u* and *i*, of the resonants *r* and *l*, this naturally not in an arbitrary way but in specific phonetic contexts, later producing regularizations which, however, left older residues in words whose etymological connection was not left clear. I also stated similar facts, illustrated with examples, from almost all other IE languages. This was in the time when these «anomalous» solutions were commonly half-hidden in the paragraphs of small print in manuals or were hurriedly explained away as «loans» or products of analogy or dialect mixing.

Today, however, the different vocalizations of the resonants following the timbres of the contacting consonants and to their placing before or after (or before and after) the resonant according to syllabic boundary, are generally accepted facts. I wish merely to quote, among others, articles by A. Mopurgo Davies (1960, 1968), F. Bader (1968-70), N. van Brock (1972), J. J. Moralejo (1973), A. Bernabé (1977). Neither does anybody deny the double solution $r\bar{a} / \bar{a}r\bar{a}$ of rH in Greek and other languages, although at times there is doubt as to its explanation. Thus in the case of K. Strunk (1969, 1970), who also postulates a degree

Ø / ø of Greek disyllabic roots with solution *lH > oli* (Gr. *πóλις*), that is with *i* vocalization of the laryngeal. In fact, the vocalizations of the laryngeals, such as are to be seen above all in Hittite, are quite comparable, as we shall see.

All this is an advance in order to demonstrate that widely accepted bases of explanation exist for that which, within the regular evolution of the laryngeals, may seem apparently irregular, although, naturally, it is above all the facts which must speak.

Really, the «regular irregularities» in question, based on the possibilities of double syllabization, gemination and different vocalization of several timbres (which alternates with non-vocalization), may be studied in each of the phoneme groups we are now going to examine. We shall speak of:

1. Initial group *HV*.
2. Group *CHC* and also *VHC* (problems of vocalization).
3. Group *CHV* (the one with the most unsolved problems).

The three groups, however, apart from their own problems display other common ones related to preservation, gemination or loss of the laryngeal; some of these problems are restricted to Anatolian, others are common to the whole of IE. Therefore, it would seem logical that we deal first with this common factor. In this case, our exposition will not be limited to presenting those opinions which tend to coincide with our own, but we shall give first-hand data, which have increased considerably since my previous studies.

It should be understood that we now refer to Anatolian *h* / *h̥* (and to their correspondences in other languages) without dealing for the moment with the preservation or loss of appendixes. That is, we shall speak both of *h* and of *h̥i h̥u*, for example, at the same times as of *ø*, *i* or *u*. Only later shall we deal specifically with the *i*, *u*, treatments and some others, although the data given herein will be of importance in arguing that certain *i* and *u* (*i̯* and *u̯*) come from laryngeal appendixes and not from an *i* or *u* lengthening.

II. H̥ / H̥H̥ IN HITTITE AND PARALLEL PHENOMENA IN OTHER LANGUAGES

A study of the results of the laryngeals in Hittite has always been of importance since the discovery that *h̥* represents the continuation of

the laryngeals as suggested by Saussure. On the other hand, it is well-known that it was not easy to discover any regularity in the Hittite results of the laryngeals established by comparison. It is clear that there is no reason to extrapolate the whole of the Hittite phenomena related to the laryngeals and attribute them to an older phase of IE. For although it is thought — as we indeed believe, cf. Adrados 1962, 1963, 1979 and the article «The Archaic Structure of Hittite: The Crux of the Problem» — that Hittite and Anatolian in general represent an older phase of IE, preserved to the south of the Caucasus from the innovations which spread to the other IE languages, this is not sufficient in itself. This archaic language, isolated from the rest, in turn underwent its own evolution, as happened in many other aspects. Thus, the fact that in Anatolian there is vacillation between h / \emptyset where an older laryngeal existed, does nothing to help understand the evolution of the rest of IE, which, save one or two exceptions, has lost all trace of aspiration derived from the consonantic laryngeals.

However, outside Hittite one does find traces of an old gemination parallel or identical to that displayed at times by Hittite in its $-hh$ -group. We also find more or less parallel phenomena with regard to the i , ai and u , au vocalizations and the development of ii , uu elements. Nevertheless, there is a general and not a detailed likeness. The differences should be explained within the evolution of each linguistic group.

After this statement, the most important point to make is that it is becoming more and more obvious that one should disregard former attempts to make certain Hittite treatments depend on particular laryngeals: specifically the treatments h , hh or \emptyset . The history of these attempts has been written in Adrados 1961: p. 59 ff., cf. also: «More on the laryngeals with labial and palatal appendixes». A new attempt, that of Eichner 1973, to prove that H_1 is lost in Hittite, uses somewhat unreliable material: assumed H_1 in $aiš$ 'mouth', etc., the interpretation of $mehur$ from H_2 , etc. Above all, other laryngeals are also lost, thus H_3 in $lāman$, 'name' among Eichner's own examples. Gramkelidze's position (1968) is not even acceptable in all its items, when it holds that h and hh are allophones conditioned by the context (h after e , hh after a or u) and that \emptyset come from analogical levellings: there are all manner of examples against it.

The simple truth is that we find vacillations h / hh , h / \emptyset and even h / hh / \emptyset in the same roots and in the same positions. We have supplied data to this effect in our book of 1961 and later in an article (Adrados 1970, included in the second edition of *Laringales*, 1973:

p. 387 ff.). We pointed out, as has also been stated above, that the fact that an aspirate which was becoming obsolete should sometimes be written in and sometimes not, is absolutely normal: a phonetic change is not brought about in a minute. At times there are also restitutions, including non-etymological ultra-corrections: there are good examples of all this in the case of Latin *h-* which was being dropped in the first century B. C. and was later re-introduced.

The existence of geminates of either expressive value or destined to produce a new syllabic boundary (both are really one and the same thing) is also normal. In Hittite, this should be even less surprising, for its geminations are in the nature of things and nothing has confirmed Sturtevant's old explanation of the gemination of the consonants. It should also be noted that the phonetics of other languages also bears witness to these same geminations (see below). I repeat that these phonetic vacillations are always within the same roots and morphological elements.

This does not mean that, at times, the same root or morphological element does not generalize the *h* or, on the contrary, its loss. The contribution of my former papers was really to point out the frequency with which *h* has been kept to characterize a root or morphological category, apart from indicating vacillations of the *arta(h)hi*, *la(h)hanza*, *ša-an-zi* / *ša-an-ah-zi* type, or *a* / *ah* in vocalizations, etc. On the other hand, the laryngeal has sometimes been lost in order to characterize roots or morphological categories which, in turn, needed to be differentiated. Cf. e. g. *ant-* 'hot' / *handai-* 'heat', *anna-* 'mother', / *hanna-* 'grandmother', *ešhar* / *išsar* 'blood'; and *huhha-* 'grandfather' / *huhadali-*, etc. with stabilization of *h* or *hh*. As far as the morphological categories are concerned, the verbal suffix *-hh* / *-ah* (this latter in 3rd. sing.) of denominative verbs may be noted with *h* / *hh*, whilst verbs in *-ai* / *-iia* or simply in *-iia* lack *h*. Therefore, it should be pointed out that the older form is *-ahi*, *-hiia* and that this, which I proposed mainly for theoretical reasons, is now accepted on the basis of preserved remains of *h* (Watkins 1975). Now too, as we shall see, the existence of an older *h* in dative forms in *-ai* is proved.

I should like to draw the reader's attention, without on any account being exhaustive, to the thesis I have upheld since 1963 that inflexion in *-hi*, *-ti*, *-i* (and the middle voice in *-ha*, *-ta*, *-a*) has its origin in radical forms with a laryngeal. That is that in the origin, the first and third pers. sing. were pure root forms to which a primary *-i* was added (and in the middle voice inflexion an *-o*). Thus in the first pers. sing. the *h* was kept, but lost in the third pers. sing. (although there are at times

traces, as in the gemination in *šakḫi* > *šakki*): in this way, the opposition was quite easily marked. The former existence of *-H* is also to be seen in the second pers. sing. (**-Hti* > **-tHi* > *-ti* according to widespread opinion). Kronasser's objection of 1966, p. 376, that it is not logical that in *arḫi* the *H* has been kept only in first person sing. and in *tarḫmi* (= *tarḫmi*) in all persons, lacks all value. For in this case it is a lexical fact (the form *tarḫ-*, as *walḫ-*, etc., had become generalized), and in the other, one of morphological exploitation of the vacillation *ḫ* / \emptyset in verbs not in *-mi*: the *ḫ* is now considered suffixal, and not radical or thematic. However, its origin is clearly radical in *arḫi*, *memahḫi*, *tarnahḫi*, etc.

In my former papers much more material is to be found to this respect, as likewise other examples in which the irregularity is explained by phonetic phenomena (assimilations, geminations). At other times I point out that Hittite may have lost *ḫ* whilst other Anatolian languages preserved it, or just the opposite.

I do not wish to enlarge further on this as I prefer to add new material and to speak of morphologizations in which the *-i* and *-u* results intervene. This new material is of several kinds. On the one hand it deals with free fluctuation, on the other with that conditioned by the diverse languages or dialects, or else by morphology. Examples of free fluctuation are discovered every day as our knowledge and interpretation of Anatolian texts improves. For example, and I keep to cases in which the laryngeal appendixes have left traces, I already indicated the fluctuation *tannattaurwanzi* / *danattahhurwanzi* and others of the *la-ḫu* / *la-aḫ-ḫu* type. I also quoted Luw. *ḫi-iš-ḫi-ya-an-ti* and interpreted Hitt. *išḫai-* as a dissimilation (a metathesis should be noted: the older form should be *ḫišaḫi-*). I shall now quote further examples. Thus, Laroche (1959) and Kronasser (1964: p. 98) indicate fluctuations in Luwian between *ḫ* and \emptyset which differ from those in the same words in Hittite: it is therefore an intra-Anatolian phenomenon. Thus likewise, Kronasser's article (1967) points to a series of roots in which degree \emptyset forms alternate with *ḫu-* and other full ones with *we-* / *wa-*; although sometimes secondary *ḫ-* before *u-* may have been introduced, the starting-point is in roots with *H \bar{u} e-* (which at times preserve *ḫ* in full degree, cf. *ḫurwant-* 'wind'). Also noteworthy is the vacillation in the transcription into Greek of toponyms with *ḫ-*: *Ḫiliku* is Κιλικία, *Ḫamanu* is Ἄμανός. It is evident that the aspiration was sometimes pronounced and sometimes not.

The most important point is above all that related to *-a*, *-ai* and *-i* stems of which the first contain the legacy of IE *-ā* and *-ō* stems; the

second may also correspond to \bar{a} stems (whose forms with $\bar{a}i$, $-ai$ are known in various languages), but also in those in $\bar{o}i$ (Gr. type $\pi\epsilon\iota\theta\acute{\omega}$). These inflexions have several factors in common: forms with $-i\bar{i}$ and, above all, D. L. in $-a$, $-ai$ or $-i$, N. Acc. V. pl. n. also of these same types, although there are redistributions at times to avoid ambiguity. It is usually thought that Hittite mixed different stems as happens, for instance, in Kronasser's lengthy exposition of 1964: p. 202 ff., which offers extremely rich material and demonstrates to anyone who approaches it without prejudice, that, on the contrary, these stems are undistinguishable, being mere phonetic or alternance variants. The same is to be thought in the case of verbs in which $-ai$ / $-a$ / $-i$ / $-i\bar{i}a$ alternate and in which a «mixture» of different types is also postulated (Kronasser 1964: p. 469 ff.).

In our studies of IE morphology as likewise in those of Dr. Villar, there is an interpretation in the sense that nominal \bar{a} stems come from $-eH^1_2$; those in $-ai$ (nom. sing. $-ai\bar{s}$) are identical (although H^1_1 may also intervene, as in *utne*, which is comparable to the $-eH^1_1$ type of Lat. *diēs*); and those in $-i$ simply represent \emptyset degree although \emptyset degree is also sometimes in the other stems, cf. *anna-* with its dat. *anni*, and the full degrees such as D. *šuppa*, *šuppai* from *šuppi-*. Of course these D. L. forms may have been added secondarily as mere desinences as in D. L. *zahḫiia* from *zahḫaiš*, which means no more than that suffixes or desinences of radical origin were later wide-spread.

However, a series of new studies, at times based on ancient data, at others on recent ones, demonstrate that in effect there are traces in Anatolian of laryngeals in these stems. These traces are sometimes preserved only outside Hittite, at others also in this latter. In any case there are traces of several laryngeals, not merely of one, and their preservation or loss displays fluctuations which are subject to the different phonetic laws of the different languages. We shall briefly give a few facts:

1. Abstracts in $-aḫi(t)$. Luwian supplies a considerable number of abstracts and collectives in $-aḫi(t)$, derived from $-a$, or $-i$, stems in which it may clearly be observed that the $-(t)$ is a secondary lengthening; cf. on this matter Georgiev (1974, 1975) and Watkins (1975). In Hittite stems in $-(a)-a-i$ of the above-mentioned declension with N. sing. $-ai\bar{s}$ usually correspond to them. Georgiev rightly alleges the numerous forms of several IE languages of the O. I. type: *sénayā*, *sénāyai*, Gr. $\gamma\acute{o}\nu\alpha$, Aesl. *ženojǝ*, etc. However, Watkins (1975: p. 365) points at the same time to

Hittite forms such as *paraḫḫiṣ*, *ḫataḫiṣ*; the *ḫ* was not systematically lost (cf. abstracts in *-(ḫ)ḫa*, such as *alwantaḫḫa* 'charm'). It seems clear that one should start at $-eH^1$. It would not seem plausible to postulate that an *-i* was arbitrarily added or not to diverse case forms.

2. Neuter plurals. In Hittite, there are sometimes neuter plurals which are the pure stem itself, thus in *-r* or *-r/-n* stems. In this way, neuter plurals in *-i* of pure stems in *-i*, in *-aa*, *-a* of the first declension (which among other things contains older \bar{a} stems) are explained. Of course, a neuter plural *šalla* from *šalliṣ*, if our theory is correct, will represent simply a final full degree $-eH^2$. In this way a distinction is made between neuter sing. and plu., as the identity of the neuter sing. and plural simply means that there was formerly no number distinction, a fact which on the other hand is well-known of Anatolian. The neuter pl. in *-ai* such as *šallai* from *šalliṣ*, *damai* from *damaiṣ* (Kronasser 1964, 202, 206) in turn represent the missing possibility. In short, that is to say that we are faced with *-ai*, *-a* forms which are etymologically pure stems. It is well-known that *-i* and above all *-a* later spread as desinences of the neuter plural outside their stems of origin. Nevertheless, if there is here no direct trace of *H*, there is in Palaic, a dialect of the same Anatolian group. Watkins gave the data in his above-mentioned article (1975: p. 360) and demonstrated how in this dialect the neuter pl. has *-a / -a-a / -a-ga* forms with identical vacillation to that found in verbal forms such as those of certain *-a* and *-na* verbs. He rightly concludes that in all these cases there are forms with laryngeals, here changed into *g*. He is also quite right to state (1975: p. 367) that it is a *sound change in progress* in which the laryngeal was being lost. I believe that these Anatolian neuter plurals could be in $-eH^2 > -a$ or in $-eH^2-eH^2 > -aga$. That means that $-eH^2$ or its derivate *-a* were added as markers to the neuter pl. of any stem, even one with the same ending.
3. D. sing. and other cases of pure stems in *-aḫi*. The *-aḫi* form to be found in the D. L. sing. of Lycian, a language closely related to Luwian, are also worth noting. But not only in the D. L. sing., but also in the N. sing. It is evidently a form of the pure stem, whether it be N. and D. L. sing., or merely D. L. (N. in *-a* or *-i*). I say that these forms are worth noting because it is obvious that there are no regular phonetic treatments. We have seen how *-aḫi* appears or not (that there is *-aḫi* or *-ai*)

according to the languages and morphological forms, and how within the same language there may or may not be *h* (or *g*). Even Lycian has, alongside the above-mentioned, a D. L. sing. in *-in* of *-i* and *-a* stems and one *-a* of these latter, etc.

These Lycian forms in *-ahi* were for a time considered as genitives, then later as declined adjectives. Thus, H. J. Houwink Ten Cate (1961: 59 ff.), among others, was deceived by the parallel between these forms and the Luwian adjective in *-ašši*. The position of Mittelberger (1968) is none other than this. But the examples given by these same authors demonstrate that the *-a*, *-i* stems declined in *-ahi* are both nouns and adjectives. Cf. for example TL 39, 3-4 *xñnahi ehbiehi* 'to his grandmother' or the fine interpretation given by Shevoroshkin (1977) to TL 43 *trijatrbbahi pñnutahi uhahi* 'on the third day of the fifth year'.

A few other data should be added. Some of these are of a phonetical nature, such as the change from *-ahi* to *-ehi* at times (Mittelberger 1964: 60 ss.), the loss of the final nasal in the Acc. sing., which left *-ahi*. Others are morphological: *-hi* spread by being added, for example, to *-i* stems: no more nor less than *-i*, *-a*, etc. and *-i*, *-ei* in other IE languages. We might even call others phonetico-morphological, for example, when *-di* is added in the Ab. sing. (*-ahidi*), or when in the nom. pl. n. and the D. L. pl. *-a* is added; the result is *-aha* (strictly comparable to Pal. *-aga* of which we spoke above).

I wish to point out that in Messapian, datives in *-ahi* of the first declension are also found and that *-hi* likewise spreads from here (cf. O., Haas 1962: p. 187 ff.). Dr. Villar drew my attention to this point.

To conclude, we may state that in *-ā* and *-i* stems either *-ai*, *-a* or *-i* is found. The presence or absence of *h*, case and number usage vary. We are not dealing with phonetic laws in the strict sense, but with the tendency of *h* to be dropped, with diverse subsequent morphological regularizations. Thus all these desinential forms spread far from their place of origin. For me it is quite clear that they are forms derived from *VH₂* which in final position give *-ahi*, *-ai* or *-a*. Originally, this doubtless happened before the consonant or the vowel, respectively, of the following word. It is not logical to believe that an *-i* of unknown origin was added arbitrarily. The *-H₂* is radical as we have already stated. However, there is certainly a phonetic law: before *-a*, *H₂* gives *h*, not *-hi*. (See below where I discuss \emptyset / i , \emptyset / u).

Similar facts are to be found in the verb. We have already mentioned verbal forms of the *išhija* type. Watkins (1975) adds a few *h*-forms from Luwian and Palaic which belong to the same verbal type; he believes that *-a / -ai / -ija* verbs had a laryngeal (p. 370 ff.). In Palaic, he finds forms in *-a*, *-aa* or in *-aga* in secondary *-a* and *-na* verbs, which he attributes to the presence of an H_2 in pre-consonantic position. We may simply have here a development of the laryngeal with vocalization.

In several former papers we pointed out how the verbs in which forms with *-i*, *-i* alternate with others with a long vowel, should be interpreted as results of H_2 stems. In very many cases it is clearly observed how *-ē* or *-ā / -i*, *i*, are radical, or at least part of the stem, most certainly spreading later to create various inflexional types. The point I should like to stress now is that the laryngeal is no longer purely theoretical for it is to be found in actual fact. Moreover, although it tended to be eliminated, in practice it survived here and there as a pure archaism. In these circumstances, to think of *-i* lengthenings (and of *-u* in other cases — see below), would seem a purely arbitrary resort, as I shall show chiefly in «More on the laryngeals with labial and palatal appendixes».

III. H^1 AND H^2 IN INITIAL POSITION, MEDIAL BEFORE A CONSONANT OR AT THE END OF WORDS

1. *In initial position.*

The phonetic treatment of laryngeals with appendix in these three positions does not pose any serious problems. The *CHV* group (consonant — laryngeal — vowel) is that which mainly needs further specifications with regard to our former studies. Even so, there are certain things of interest to be noted in several other groups before we move on to this subject.

I believe that in initial position the phonetic problems of the laryngeals are today fully solved, once one accepts that *h*- is dropped sporadically in the Anatolian group and regularly in the rest of IE. In short, the labial and palatal appendixes are dropped before a vowel and also before a resonant and a consonant. The opposition between the two series of laryngeals is therefore neutralized and as a result the whole theory may be elaborated without taking into consideration whether the laryngeals have labial or palatal appendix.

There are two different cases. If either of the vowels *e* or *o* (eventually *a*) follow, the timbre of the laryngeal conditions that given to this vowel, for it is obvious that both laryngeal and vowel share the same syllable. Therefore:

$H_1e/o > He-$	(Anat. (h) <i>e</i> -, other languages <i>e</i> -)
$H_2e/o > Ha-$	(Anat. (h) <i>a</i> -, other languages <i>a</i> -)
$H_3e/o > Ho-$	(Anat. (h) <i>o</i> -, other languages <i>o</i> -)

The only problems are those dealt with in *Laringales* and there is also later bibliography on them. I shall not go into them here but will merely make a brief mention of them: the existence of analogical timbres (preservation of *e* or *o* by analogy of parallel morphological categories); eventual presence of a vocalic prothesis. I specifically refer to A. Bernabé's paper (1975), among other works, and would recall by the way that the stance I took was that neither is the prothesis compulsory when there is an initial laryngeal (not even in Greek), nor does any prothesis automatically indicate an initial laryngeal.

The second case is when a consonant or resonant follows the initial laryngeal. In Anatolian there may be h or \emptyset before a resonant, as we have already indicated. It may be assumed that the same happens before a consonant, although in words which begin with haC it sometimes seems difficult to ascertain whether it is in fact an older *HVC* group or the spelling for an older *HC* group. Greater interest is found in the case in which μ or $\dot{\imath}$ follow. These groups occur in disyllabic roots which include *HuH* or *HiH*, and may take a vowel *V* either in the first position (P/\emptyset degree: *HVuH*, *HViH*), or in the second (\emptyset/P degree: *HuVH*, *HiVH*), or else be missing in both (\emptyset/\emptyset degree, our initial formulation). Of course, the *H μ* , *H $\dot{\imath}$* groups occur in degree \emptyset/P : type **H μ eH¹* 'to blow', *H $\dot{\imath}$ eH²* 'to join' (although with the *i* type this is very rare). There are also, of course: *H μ eC*, *H $\dot{\imath}$ eC*.

I have given this morphological explanation because the situation is different in the centre of each word. As far as I know, there are no medial groups with *H μ -*, *H $\dot{\imath}$ -*. This is due to the fact that all the $\text{-}\mu$ and $\text{-}\dot{\imath}$'s used in IE morphology, with the exception of the deictic type, come from *H²*, *H¹*, which is in turn due to the fact that, whereas there are a great number of roots ending in *H²*, *H¹* (whence this morphological usage), there are on the other hand, hardly any roots which end in $\text{-}\mu$, $\text{-}\dot{\imath}$: as far as I know, only **ei* 'to go' and **trei* 'three'. The remaining originary μ and $\dot{\imath}$'s come in the middle of a syllable: the **leik²* type. Their existence is proved for they do not alternate with long vowels in contrast to the μ and $\dot{\imath}$'s which come from *H²* and *H¹*, but as they

are not final, they cannot be morphologized. (Cf. Adrados 1973: p. 44 and Bernabé 1976: p. 182).

In IE there are therefore initial groups $*H_{2e}V$, $*H_{2i}V$, in which no possibility of reconstructing an old labial or palatal appendix is observed; there is neutralization, such as when V (or resonant or consonant) follows. The phonetic result of these groups is different to that of HV . If we exemplify by H_2 we get, for example:

$H_{2e}/o > Ha-$ (Anat. $(h)a-$, other languages $a-$)
 $H_{2e}/o > H_{2e}/o-$ (Anat. $(h)\mu a-$, h_{2e} , other languages $\mu a-$, $\mu e-$).

This second type consists of such correspondences as Hitt. $\mu ar\dot{s}a-$ 'rain' contrasted to \emptyset degree $hur-$ 'to be wet'; in other languages there is O. I. $w\bar{a}r$ 'water', Toch. A. $w\bar{a}r$ 'water', Gr. $\text{F}\acute{\epsilon}\rho\sigma\eta$ 'dew', etc. It should be noted that both in the full degrees and in the \emptyset ones there may be vocalic prothesis: cf. Gr. $\acute{\epsilon}\text{F}\acute{\epsilon}\rho\sigma\eta$ and in another root, Lat. $au\bar{e}re$, O. I. $avati$ 'to wish', alongside Hitt. $hu\dot{s}k-$ 'to wait' (see data in Adrados 1973: p. 73 ff. and 1975: p. 192 ff.). On the other hand, occasional aspirates exist, above all in Greek, both in the full degree and mainly in the \emptyset . In this latter they are normal in Hittite, cf. Kronasser 1967.

Thus, should we have hesitated at any time as to whether to propose H^u- or H_{2e} , H^i- or H_{2i} for the older forms which gave Hittite results of the type H_{2e} , H_{2i} (with $HuC-$, $HiC-$ in \emptyset degree), our position was made quite clear in the second edition of *Laringales* (1973: p. 398). Two different phonetic results imply two different origins. Root theory and morphology confirm this.

Having specified this point, it must be added that in Hittite, apart from initial h_{2e} , $\mu e-$ (and of course h_{2i} , $\mu a-$), we find:

$h_{2i}V$: $h_{2i}\mu ant-$ 'wind' from $*H_{2i}eH^i_1$ (O. I. $v\bar{a}ti$, Gr. $\acute{\alpha}\text{F}\eta\mu\iota$, etc.)
 $h_{2i}V$: $h_{2i}ek-$ 'to charm' from $*H_{2i}ek^u_1$ (O. I. $vdcas$ 'word', Lat. uox , etc.).

They are two spellings which come to mean the same thing, cf. below. In any case, it is a disyllabic result instead of a monosyllabic $h_{2i}V$ one. This double possibility is also given in roots which, as far as we know, begin simply in $\mu V-$, $iV-$. For example, in the verb $iezzi$, $i\bar{a}nzi$ 'to do' from the root of Gr. $\text{I}\eta\mu\iota$, Lat. $iacio$ (without reduplication, contrary to Georgiev 1971), or in the verb $i\bar{a}h\bar{h}ari$ 'to go', cf. O. I. $yanti/iy\acute{e}$ or in the verb $\acute{u}iz-zi$, $\acute{u}\mu ami$ 'to come' (cf. Georgiev 1971 bis). For further data see *Lingüística Indoeuropea* 1975: p. 190. I shall not go into regularizations in the different languages.

The most important fact for us in this context is that in all cases in which Hitt. initial $h-$ is followed by u or i , it appears that these

clearly come from resonants, and are not the result of the appendix. Ø degree forms with *i* vouch for this: cf. to give an example with *i*, Hitt. *išḫuzzi-* 'belt', from **H_ieH²*, 'to join' (Gr. ζώνη, etc., in Ø/P) with metathesis *Hs* > *sH*. It should be noted that when *u* or *i* get between the laryngeal and the vowel, the timbre of the laryngeal does not affect this latter; we cannot even identify it. On the other hand, when *H²* and *H¹* were reduced to *H* before a vowel, the timbre was preserved and affected the vowel; it is obviously a very old phenomenon.

There would really be no theoretical objection to the existence of an initial vocalization of *H²* and *H¹* in (*h*)*u* and (*h*)*i*, such as those which exist in medial position, nor to results *H²V-* > (*h*)*u₂V*, *H¹V* > (*h*)*i₁V*. But in so far as they may be etymologized, forms of this type occurring in Hittite respond to forms from other languages with *u-*, and *i-* in initial position. We have already offered our explanation from the point of view of root theory³. On the other hand, we find *HR-* (laryngeal + resonant) groups in which the first element is dropped (as in Hitt. *lāman* 'name', from **HenH²*), or vocalized, but not in *u*, or *i* (cf. for Greek: H. Rix 1970). When there are these vowels, as far as we can judge, we get *H_u-* or *H_i-* groups, cf. for example, Hitt. *ḫulana-* 'wool' alongside Goth. *wulla*, etc.

Certainly in initial position before a vowel, resonant or consonant, there is no trace of an appendix accompanying the laryngeals. If it were only a case of the initial position, the theory of laryngeals with appendix would never have arisen. Matters are quite different as far as medial positions in which laryngeals are vocalized are concerned.

2. In medial position before a consonant: CHC Group.

As I stated above, one should not be surprised today at the variety of vocalizations of the IE laryngeals in relation to the phonetic context, nor at the fact that these different vocalizations may undergo generalizations or displacements, although traces are left of less favoured solutions. I say this because there are many linguists who today ac-

³ Strictly speaking, it may be thought that fluctuations such as *ḫurtai-* and *ḫu₂artai-* 'to curse' correspond respectively to *H²ort-* and *H²V-* with the results *ḫ₂rC* and *ḫ₂u₂V*. The former would represent a different vocalization to Hier. Luw. *ḫartai* (cf. other pairs: *ḫurnāi* 'to follow' / *ḫarnai* 'to hunt', *takšul* 'friend' / *Takšalas*, Neuman 1961: p. 18), neither more nor less than Pal. *ešhur* as against Hitt. *ešhar*. As for *ḫu₂artai*, it would represent a disyllabic treatment of the *CH²V* group. But in order to make this theory credible and phonetically plausible, etymological justifications would also be needed for the existence of the *H²* and the absence of *μ*. There are none; on the contrary, we find abundant IE etymologies of the *ur-* type (cf. Eichner 1973: p. 73 ff.).

knowledge the existence of phenomena of this type in the case of the resonants, which certainly belong to the same class of phonemes as the laryngeals. In the first place, vocalization of resonants may occur before or after, or before and after same (Av. *ərə*, Ved. disyllabic *r̥* from IE *r̥*; *ǎrǎ* solutions and others from *rH*). In the second place, the general tendency in the vocalization of resonants is:

In contact with labials and gutturals:	<i>u, o.</i>
In contact with <i>s</i> and palatals:	<i>i, e.</i>
In all contexts:	<i>a.</i>

This last tendency comes from a more general one to establish, in syllables of which the centre is a resonant (*CRC*), the maximum difference between centre and margins: *CRC* tends to *C^oRC* (or *CR^oC* and, with double syllabization *C^oR^oC*) and *o* to *a*. The history of vocalization in each language consists of counterposed tendencies to generalize *a* or one of the phonetically conditioned solutions, with diverse results. I have given bibliography on this matter above and refer the reader to it.

As far as the laryngeals are concerned, it seems clear that, as they are open, aspirated phonemes, the timbre of the front vocalization (*°H^u*, *°Hⁱ*) should tend to *a*; and that of the back vocalization to *u, i* (*H^{uo}* > *Hu*, *H^{io}* > *Hi*). These vocalizations are not without exception: it should be noted that there is *uHu*, *iHi* (doubtless through assimilation) and that upon occasion, *H^u* is vocalized in *i* before palatal phonemes. But the former are the regular solutions. On the other hand, that *a* should be a «front» solution» and *u, i* «back» solutions, is not merely a plausible theory: Hittite regularly presents forms *aḫ*, *ḫu*, *ḫi*, *aḫ(ḫ)u* which are irrefutable proof (as are the solutions *au*, *ai* in other languages)

No-one denies the *a* vocalization (and it is becoming increasingly clearer that Greek *e, o* are analogical, cf. recently Kuryłowicz 1977). As regards *u, i*, which are more difficult vocalizations to accept, we wish to stress an extremely remarkable parallel: *u* vocalization of labiovelars. Obviously this means *K^{uo}C* > *KuC* (any labiovelar being symbolized by *K^u*). I give herebelow a few data from Anatolian:

A good starting-point is *neku* 'evening, night', from **nek^ut-* (for vocalism and IE etymology cf. Schindler 1967). The *ø* degree *kunanzi* from *kuen* 'to kill', root **g^uhen* is well-known. Note also *ekumi* and many other forms of 'to drink', related to the IE root with labiovelar which is in Lt. *aqua* (cf. Pal. Inf. *aḫuna*). Generally, there are *k^uo-* or *k^ui-* forms which are derived from the interrogative-indefinite pronoun,

but in Lydian abundant material is found for *k²°C: *kud* 'where' and derived forms. Lycian offers a form, quoted above in another context, *pñnuta* 'fifth' from *pñk²to-. It is of interest to note the habitual presence of other forms with *u* alongside these vocalized forms. This is exactly the same as in the case of the *H₂o*- group with disyllabic treatment in initial position as we have seen, and as in that of the *H²o*-group with the same treatment in medial position as we shall see.

This *u* vocalization is habitual in labiovelars in different languages, even in those in which habitual vocalization of the resonants (or of C°C groups) is different. One need only point to Greek γυνή (alongside the normal *a* in Boeothian βανά); Lat. *cur* and other derivates of *k²°*; Lat. *secutus* alongside *socius*, *secta* with loss of the appendix; Gr. κύκλος Toch. A. *kukle* < *k²-k²los, etc.

This last example on the other hand shows (as likewise O. Lat. *quinctus* alongside Lyc. *pñnuta*-, for example) that the vocalization of a *k²-C* group is facultative: there are two alternatives *k²°-C* / *k²-C* > *KC*, free variants which precede eventual regularizations in one or another sense. Moreover, we find exact parallels in the case of the laryngeals.

Bearing in mind that the *h* of Anatolian may be missing where it is etymological, it is quite clear that the regular vocalizations we have suggested may be of the *a(h)*, (*h*)*u* or *a(h)u* types; but, together with these, forms appear in which simply a consonantic *H* without vocalization has either been dropped or preserved as /*h*/, which is usually written *ha*. All this causes certain difficulties, but at the same time the cases in which there is alternatively *h* or lack of *h* help interpret others in which there is merely either ∅ (loss of consonantic laryngeal) or else *u*, *au* or *i*, *ai* (vocalization of *H²* and *H¹* respectively).

I do not think it necessary to theorize on the case of preservation of consonantic *H*, eventually dropped in Anatolian and regularly in other IE languages such as Iranian, Baltic and Germanic. If what in Anatolian is an alternative solution, and in certain of the later languages is a regular phenomenon and in others, a non-existent or anomalous one, this means that the alternative solution of Anatolian — whether consonantic *H* or the vocalized one — is older and the behaviour of other languages is based on regularizations. On the other hand, that this should be so may be deduced from the very fact that languages such as Sanskrit and the Iranian group, which as a whole show counterposed choices, present exceptions in the opposite sense to that commonly followed (cf. data in *Laringales*, 1973: p. 125).

However, it is of interest to point out here some cases in which, in Anatolian the *h* and *ah* / *hu* (or *hi*) treatments appear alternatively,

that is, consonantic and vocalic treatments with preservation of *h*. In the case of consonantic *h*, this may appear either at the end of a syllable, or be written *ha*. It is in fact thought that *eš-ha-na-aš* as against *e-eš-na-aš* represents /ešhnaš/ as against /ešnaš/ and that *ša-an-ha-ti* as against *ša-an-zi* is a similar case.

On other occasions, forms such as these with /*h*/ or /*h̥*/ are parallel to those with *ah* or with *hu* (with *hi* if it is a case of *H¹*). Of course, it also happens that only vocalized forms appear. For example, from the first of the two words quoted we have Pal. *ešur*, against which Hitt. *ešar* is probably a form with /*h*/ > *h̥* or at any rate, analogical of the genitive, etc.; from the second, there is *ša-na-ah-ti* (and forms with consonantic *h* before a vowel: *šanhanzi*). Certainly there is also *hu* vocalization (and *-uuV*), in verbal forms in which *u* is grammaticalized, cf. below. More remarkable cases are those in which *ah* / *hu* (and *ahu*), *ah* / *hi* (and *ahi*) alternate: cf. *tar-ah-zi* / *tar-hu-uz-zi*, *tar-ah-hu-un*; *ua-al-ah-zi* / *ua-al-hu-un* (alongside which the expected forms *ualhant-*, *ua-al-ah-hu-e-ni*). It seems there is no room for doubt that in these verbs the 1st. pers. sing. pret. in *-ahhun* (also existing in *šanh-*) and the 1st. pers. pl. pres. in *-ueni*, are morphologizations of root forms.

These data are completed by others relating to more isolated forms in which linguistic comparison may help us. The form *pahhur* 'fire' is well-known, comparable to Gr. *πῦρ*, etc., and also the forms in free variation *tuhš* and *tuhuš* connected with Gr. *θύφος*, *θύμός*, etc. Lesser known, however, is the hieroglyphic Luw. form *dahušīa*, which shows the older vocalization *ahu*, at other times assimilated to *uhu* (whence, doubtless, **dhūmós* in the rest of IE if it does not come directly from *°H^{uo}*, see below). Cf. also, certainly, *tah(a)tumar* (Neu 1970: p. 91): the older form is *tah-*; *tuh-* must be analogical to *tuhu-*. The *hi* form is found for example, in *me-ik-ki-iš* 'large' with assimilation, cf. Gr. *μέγας*; in *palhis* 'wide' (together with *palheššar* 'width') there is doubtless *i* by assimilation to the *s*, for it is a case of *H^u*, cf. O. I. *papráu*, Lat. *plēui*, Gr. *πληψων*. In verbal forms, *is* is frequent from *H¹* and from *H^u* (through the same type of assimilation) in the well-known *mem-mahhi* / *memišta* type. But in the verb there is also *a/u* < *H^u*, cf. *tar-nummeni* and *tarnatteni* from *tarnahhi*. On the other hand, the *i* of *H^{1o}* is also found outside the verb, cf. for example, *tetḫima-* 'thunder' from *tetḫai*. To sum up, and disregarding exceptions of the assimilatory or analogical type and purely graphic difficulties, the *CHC* group in Anatolian gives the following results:

1. With consonantic *H*: *H* > (*h*)
2. With vocalization: ^o*H* > *a(h)*
 H^{1o} > (*h*)*u*
 H^{uo} > (*h*)*i*
 ^o*H*^{1o} > *a(h)**u*
 ^o*H*^{uo} > *a(h)**i*.

We might add certain remarks to his brief summary:

a) Irregularities and doubtful cases exist. Sometimes, for example, there is doubt as to whether *a* comes from ^o*H* or from *VH*: *paḥḥaš* 'to protect' (the *ḥa* of which is surely graphic). The forms *aḥḥu*, *aḥḥi* may sometimes simply represent spellings of *ḥu*, *ḥi*.

b) Of course the *h* forms support the fact that others without it (forms with *a* or otherwise *u* or *i*) are also vocalizations, whenever this is backed by the etymology. Above, I quoted *tarnummeni*; verbs in *-numi* among others, should be added (where the \emptyset degree is an older form), according to the interpretation I put forward some time ago. There are also isolated words: thus *aruna*- 'sea', cf. O. I. *árna* 'wave', *írte* 'it moves'; *daluki*- 'wide', cf. O. I. *dīrghá-* and Greek $\delta\omicron\lambda\iota\chi\acute{o}\varsigma$ (there is possibly *H*¹ and Hittite offers assimilation; Strunk (1969 and 1970) now admits that this is a vocalization of the laryngeal).

c) The whole theory is supported by the results of the *VHC* group, which we shall study below, and by the final *-H* group. In fact it supplies abundant examples of *-(h)u* and *-(h)i*, with maximum frequency in the same roots or stems studied here. There are also isolated forms such as the well-known *šeḥur* 'urine', *meḥur* 'time' (see place quoted). At the same time, it is clear that there exist parallels of these *CHV* treatments which give *CuḥV*, *CiḥV* in the same roots and stems. These are the types *memahḥi*, *mematti* (both with *-ah-*) / *memanzi* (loss of *H* before a vowel) / *memišta* / *memižanzi*; *aiš*, *iššaš* 'mouth', *ḥastai* / *ḥastijaš* / *ḥastit* 'bone', etc.

d) All the data supplied herein, as likewise other material from part II of this article, demonstrate that a series of flexional, nominal or verbal elements spring precisely from roots and stems with morphologized laryngeals. In part IV I shall add a few further details.

Finally, it is essential to stress that the vocalizations of *H*^u and *H*¹ which we have studied and the *u*, *i* forms connected with the former, are by no means exclusive to Anatolian, but belong to the whole of IE. There is no need to repeat here the material which supports this theory and which on the whole has been offered in the books and studies

quoted. Alternations of *a/u/au* and *a/i/ai*, in the same language or in several and in places in which one would morphologically expect \emptyset degree, are thereby explained. To quote a minimum of examples, I should point to: O. I. *sṇāti/ snutá-* as compared to Lat. *nāto*; Lat. *sēmen, sēui* compared to Lat. *sātus*, O. Ice. *saurr*; Lat. *cōs* compared to O. I. *šitá-*, Lat. *cātus*. This means no more than to exemplify types of maximum frequency. I recall the practically total generalization of *i* in O. I.

Of course, morphologizations such as those of several case endings of *-a* and *-i* nouns, neuter plurals in general, first persons with *-u*, various verbal forms with *-i-* and other variants, *-nu-*, etc. are not only found in Anatolian, but in all flexional IE; they belong to what I have elsewhere termed IE II. IE III, which creates polythematic inflexion of the verb and introduces other innovations in the noun (clear classification of *-ā* and *-i* stems, feminine gender, comparison of adjectives, etc.), specializes these morphologizations to mark their new categories and functions. It also creates new morphologizations, which proves that H^u and H^i reached this stage of IE. I refer in this sense to the above-mentioned papers to which I wish to add one or two remarks in the following pages. I shall restrict my examples here to the perfect participles in *-uos, -uot*, which spring from roots with $-H^u$ (cf. Gr. $\beta\epsilon\beta\lambda\eta\text{-}\text{F}\acute{\omega}\varsigma$, $\tau\epsilon\theta\nu\eta\text{F}\acute{\omega}\varsigma$ and Adrados 1963: p. 198 ff.); Hittite has an infinitive in *-uanzi*, a supine in *-uan* and a 1st. pers. pl. in *-uen(i)* which are of the same origin but, as may be seen, are different.

Proof that, as I suggest, H^u and H^i reached IE III, is found in morphological elements (and also lexical ones) different to those of Anatolian and newly created. Sometimes independently, sometimes together, the non-Anatolian languages present *u* or *i* of laryngeal origin which have no parallel in Hittite and cannot be explained by the IE I. Moreover, there are traces of *hi, hu*, above all in O. I.: forms such as *sákhibhis* (from a stem in $-eHH^i$), N. sing. *sakhā* has an analogical *h*). However, the normal thing is that forms with *i* should respond to Hitt. *hi*, in both nominal and verbal types, as those mentioned already; or that there should be simply forms with *i*, either common to the whole of IE, or only to post-Anatolian. The same may be said as far as the derivatives of H^u are concerned.

More or less the same thing happened with the laryngeals as with the labiovelars: the treatments with loss of the appendix, with vocalization or with $u\bar{u}, i\bar{i}$ results before a vowel, are established or generalized in each particular language. It should of course be added here that the same laryngeals were lost from a certain point of time onwards:

in the Anatolian which has come down to us they were already being dropped (they are missing in Lydian); in the rest, there are hardly any left. On the other hand, the timbre of the vocalizations of the laryngeals, as likewise that of the resonants, is fixed in the individual languages. Should proof be needed of this, it lies in the fact that post-Anatolian (or IE III) presents vocalization treatments which we have not so far mentioned and which are different to those of Anatolian.

I refer to treatments of the $rHC > rā$ type, which I have explained as derivatives of ${}^{\circ}rHC$ with compensatory lengthening; the prevocalic forms of the type of Lat. *flāuus* (from **bhelH²₃*), O. I. *ūrv* (*mūrṽ* from **melH²*), etc., should be added. It is sufficient to refer to *Laringales* 1973: pp. 211 ff., 293 ff. However, this occurs only in disyllabic roots with the resonants *r, l, m, n*; there is nothing remarkable in the case of *u, i* for the laryngeal lengthens them. The above-mentioned result *ū* from *H²* is, however, curious, as is that of *ī* from *H¹* (cf. *Laringales* 1973: p. 270 ff. which offers abundant examples). My theory is that either *aHu* becomes *uHu*, whence *ū* (see above on Hitt. *tuḫu-*) and likewise in the case of *iHi*; or else ${}^{\circ}H^{\circ}$ passes directly into ${}^{\circ}Hu > \bar{u}$ and likewise in the other case. Therefore, there should be in the case of double vocalization, a secondary choice between *au* and *ū*, and *ai* and *ī*.

It would appear, therefore, that the laryngeals with appendix and their vocalization possibilities were kept alive after the separation of Anatolian. Of course, certain reserves should nevertheless be applied in view of our limited knowledge of the vowel length of this latter. Its evolutionary lines are similar to those of the rest of IE, but there are differences in details. The study of the *CHV* group leads us to similar conclusions.

I would repeat, however, that, despite appearances, all this occurs within a basic regularity, backed by well-known principles which have their parallel in the case of the resonants and the labiovelars. The *a/u/au* variations and others we have examined are explained as instances of choice among possibilities which IE Phonology left open, fundamentally with regard to syllabation.

I prefer not to discuss here the *CH* group (end of a word). The theoretically expectable results ($-H > -\emptyset$ and vocalization $-Hu > -u$) are confirmed by scant existing material, to which it is better to refer in the context of alternating forms of the full degree, that is, in IV.

3. *In medial position before a consonant (VHC group) and in final position.*

The phonetic results of the *VHC* and *VH#* (final position) groups are identical, except for certain reductions, doubtless analogical, in the latter case. This is without a doubt due to the fact that when the following word began with a consonant, *VH- C-* was identical to *VHC*; when it began with a vowel, *CH- V-* produced the same results, doubtless on account of juncture. We shall therefore deal with these groups together.

There are, in this case, no big problems. Only a few specifications are necessary.

The *HC* group, whether it is *H^uC* or *HⁱC*, has the same possibilities of evolution after a vowel as after a consonant:

- a) — If the laryngeal and the consonant form the end of a syllable, the former drops its appendix; in Anatolian it is either dropped or preserved, in the rest of IE it is dropped.
- b) — If the laryngeal and the consonant are separated by the centre of a syllable, there is vocalization which, logically, would be a *u* in the case of *H^u* and an *i* in the case of *Hⁱ*. The subsequent fate of the laryngeal is already well-known. There are, however, a few differences:
 - a) In the *VHC* group the centre of the syllable is clearly the vowel (except when the new syllable *H^oC* discussed above is formed). *V^oHC* is impossible and thus, too, the vocalizations *a(h)*, *a(h)u* from *H^u* and *ah*, *a(h)i* from *Hⁱ*.
 - b) In the same group, when there is a *V-HC* syllabation with the result *V-H^oC*, or *V-HC*, it is obvious that the timbre of the laryngeal does not affect the preceding vowel. But when the syllabation is *VHC*, it is logical that it should influence this latter. This problem does not arise in the previously discussed *CHC* group.
 - c) The displacement of the syllabic boundary may be accompanied by gemination of the laryngeal. In Hitt., this gemination is corroborated by the spelling (*hh*); outside Hitt., indirect traces of it are left as there is lengthening and a change of timbre of the preceding vowel.

If one exemplifies with *e* and H², the results will therefore be:

1. Without vocalization:

$eH^2C > aHc > \bar{a}C$ (Anat. *a(h)*, other languages *\bar{a}*).
 $e-H^2C > e-HC > eC$ (Anat. *e(h)C*, other languages *eC*).

2. With vocalization:

$e-H^2C > e-HuC > euC$ (Anat. *e(h)uC*, other languages *euC*).
 $eH-H^2C > aH-HuC > \bar{a}uC$ (Anat. *a(h)u*, other languages *\bar{a}uC*).

The treatments in final position are identical, although there is little evidence apart from *-\bar{a}*, *-\bar{a}u*, see below.

This very simple theory is supported by processes of displacement of the syllabic boundary and gemination which are well-known and are also clearly manifest in Hittite. When applied to the six laryngeals, this allows one to explain variants of the *\bar{o} / eu (ou) / \bar{o}u*; *\bar{e} / eu (ou) / \bar{e}u* type. There are rarely even variants with a short vowel (*e*, *o*, according to apophony). Of course, they are always full degree groups. In the \emptyset degree, the correspondences we already know exist.

To exemplify very quickly, these are well-known alternances of the type of O. I. *dyāus / dyām / dyāvi*, Gr. $\xi\pi\lambda\omega\sigma\alpha / \pi\lambda\acute{\epsilon}\phi\omega$, Lyth. *plāuti*. In final position there is a tendency to analogical reduction to doublets such as *-\bar{a} / \bar{a}i*, *-\bar{o} / \bar{o}u* without doubt in order to make relation between the forms clearer. It should be borne in mind that the solution without *-u*, *-i* before a consonant or *-u*, *-i* before a vowel, occur most frequently: thus in O. I., for example, in *jajñā / jajñau* in the perfect, *aṣṭā / aṣṭau* 'eight' (and in «two» and the duals, which I consider analogical). It is true that at times the existence of both forms is used to mark morphological differences (N. *-\bar{a} / D. -\bar{a}hi*, or *-\bar{a}i*, in several languages), whereas at other times, one or the other form is generalized according to each language (Gr. $\delta\kappa\tau\acute{\omega}$, O. H. G. *ahtau*). Neither are treatments with short vowels lacking, thus D. sing in *-ei* from *i*-stems (Gr. $\pi\acute{o}\lambda\epsilon\iota$, cf. Villar 1974: p. 195 ff.). For the rest, the analogical regularizations are not restricted to final position. A clear example is the *-neu-* / *-nu-* verbs, another the generalization in Greek of $\pi\lambda\epsilon\upsilon-$ (against archaic $\xi\pi\lambda\omega\sigma\alpha$); there are an infinite number of examples in this sense.

It is well-known that these alternating series have caused and are still causing serious problems in IE phonetics and morphology. I am not going to argue here on the advantages of my own explanation and the drawbacks of others: I merely refer to former publications and to my forthcoming article «More on the laryngeals with labial and palatal appendixes». I wish merely to stress that it is a particularly economical

theory and that it is backed by coherent, realistic phonetic and phonological principles. It would be impossible to explain the *-i* or *-u* which in so many roots and morphological elements alternates with *ā* and various long vowels, if one explains it by original IE *i* or *u*: neither phonetics nor etymology, nor morphology are satisfactory here. How, for example, may one explain the *-hi* > *-i* of the most diverse forms of several declensions when they alternate with forms without *-hi* or *-i*, again in the most diverse instances? This is only possible on the strength of a phonetic evolution which takes place under certain circumstances; it is certainly not so on the strength of etymological *-hi* or *-i* with a given meaning. There is an infinite number of similar examples; I shall repeat a few herebelow.

What I wished to achieve here was to repeat certain data of Anatolian which help support the theory and which also display morphological interest. In Hittite, there is free alternation, in certain verbs, of *-ah̄ti* and *-atti* (cf. Kronasser 1966: p. 98), which proves the occasional preservation of *ah̄*, for the geminate bears witness to this (cf. on the geminates from this type of assimilation, Bernabé, 1973 and Watkins 1975: p. 375 ff.). Other assimilations of the same type are Hitt. *aššu-* 'good', together with Gr. ἡσός, *hašši-* 'home' together with Lat. *āra*. But forms without *h̄* also exist. Thus in the verbs, where alongside *memah̄hi*, *mematti* there is a 3rd pers. sing. *memai* without a trace of *h̄*: I have elsewhere stated that precisely the 3rd pers. sing. drops the *h̄* in order to differentiate itself morphologically (the final *-i* of all these forms is deictic *-i*, not that of laryngeal origin). Alongside this, there are other verbs with generalized *h̄* as an element of the stem (denominatives in *-a(h̄)h̄*) or with generalized *-ā* (*hatrāmi*, etc.). Naturally, together with these forms, there are others with traces of *-u*, *-i* vocalization according to their roots. If we keep, in the first place, to *-i*, there is a series of well-known facts of this type in verbal inflexion: together with the pres. *hatrāmi*, *-āši*, *-āti*, there is a preterite *hatranun* (a hypercharacterization of older **hatran*), *hatraeš*, *-it*; cf. also the pres. *teḫḫi*, *daitti*, pret. *teḫḫun*, *daiš*, and other parallel cases in which there are also *-i*, *-i-* forms and which pose the problem of whether *-a-* is a full degree *-āi-* or a \emptyset *-ai-*. Things are even clearer in the case of the noun, in the full degree of which we have discussed alternances of the *-ā* / *-āhi*, *-āi* type (and at the side of these \emptyset degrees *-a* and *-i*) and in which an archaic Hittite type N. *-aiš* / Acc. *-an* is regular and parallel to O. I. *dyāus/dyām* (cf. Weitenberg 1979).

If we continue with *-u* forms, we here have the incomparable advantage that *-ehu* forms have been directly preserved: *šeḫur* 'urine'

from **seH*¹ 'seed' according to general opinion, *meḥur* 'time' from **meH*¹ 'to measure' (the common opinion) or **meH*² (cf. Lat. *māurus*, Eichner's opinion 1973). One should also compare them with Hitt. *paḥhur*, Luw. *eṣhur* mentioned above: there is vocalization in both cases, in the former after a vowel, in the latter after a consonant.

This leads us to interpret as derivatives of older forms with medial *-ḥ-*, other forms in which this *-ḥ-* no longer appears: thus, Lyd. *dāv* 'in time' (cf. O. I. *dyāu-*) and several forms such as *ḥarnauš*, etc.

What occurs in the verb, however, is more noteworthy. We shall enlarge on this dealing simultaneously with forms with *-u* after a vowel and others after a consonant. Among these we shall disregard the already quoted type of *tarnummeni*, and all verbs in *-numi*, the origin of which we have stated to be in **neH*² / **nH*² (with generalization in Hittite of the \emptyset degree), as in all IE languages.

To begin with, we should like to discuss the 1st. sing. pret. of the *da-aḥ-ḥu-un* type from *da-aḥ-ḥi*. In my *Verbo indoeuropeo* (1969: p. 131), I explained the *-u-* as result of a *-un* vocalization from the final *-m* after *-H*². It is more commonly said that the old desinence of 1st. sing. pret. was *-ḥa* (as in the other Anatolian languages), which changed to *-ḥun* through the analogy of the *-un* of the *-mi* verbs. A third theory, that of Benveniste (1962: p. 68 ff.) and Dressler (1964), among others, explains the *-u* as identical to that of well-known past forms of the type of O. I. *jajṅau*, Lat. *gnōui*, etc. According to Dressler, this *-u-* is that which spread in *eṣun*, *arnunun*, etc.

My formulation was really somewhat equivocal when I spoke of vocalization of *-m*, but what I basically proposed was a vocalization *-H*²*m* > *-hun* of the type discussed here. I also compared this form with the type of *jajṅau*, *gnōui*, etc., etc., for in my book I specifically pointed to the derivation of all these stems from *-H*² roots. Exceptions may be forms such as Hitt. *ekkun* in which there is a *-k*² root, quoted above and in which the *-u-* comes from the vocalization of the appendix of the labiovelar. As for *-un* in verbs with consonant stems (*eṣun*), I see no objection to continue thinking of it as a vocalization of *-m*; at the most it may be granted that *-ḥun* influenced the generalization of the *-u-* timbre.

However, I should now like to offer certain modifications to my former suggestions. It so happens that:

- a) The aorists and perfects with *-u*, which sometimes alternate with \emptyset , are originally pure stems used in 1st. and 3rd. sing. with the aid of secondary differentiations, as I have already pointed out.

Thus in O. I. 1st., 3rd. sing. perf. *jajñau* / *jajña* (2nd. sing. *jajñātha*), from a root with the laryngeal $-H^h$, as well as other forms conjugated along the same model (*dadau*, *tasthau*); thus in Lith. 1st. sing. pret. $-iaû$ / 3rd. $-ē$ (from $-eH^h_1$ with morphological usage of the $-ēu$ / $-ē$ results), 1st. sing. pret. $-aû$ / 3rd. $-o$ (from $-eH^h_2$ and its results $-āu$ / $-ā$); and in Gr. forms such as $\pi\acute{\epsilon}\phi\eta$ and $\beta\epsilon\beta\lambda\eta\text{F-}$, $\tau\epsilon\theta\nu\acute{\alpha}\text{F-}$ (in $\beta\epsilon\beta\lambda\eta\text{F}\acute{\omicron}\varsigma$, $\tau\epsilon\theta\nu\acute{\alpha}\text{F}\acute{\omicron}\varsigma$).

- b) Therefore, forms with $\text{-}a(i)$ such as Lat. *gnōui* (alongside *gnōsti*), Toch. *akšāwa* (together with *akšāsta*) are obviously secondary for the element $-a(i)$ comes precisely from $*-H_2o$, that is to say, from a thematicized final $-H_2$ of a pure laryngeal stem: I refer to my *Verbo indoeuropeo* and to a new article (in this volume): «Perfect, Middle Voice and IE Endings». This is a recently dated innovation as it is based on $-a$ and not on $*-H_2o$; there is also an older innovation, Gr. $\beta\acute{\epsilon}\beta\lambda\eta\kappa\alpha$, if it really comes from $*-eH-H_2o$ (cf. *Verbo indoeuropeo* 1963). Another innovation is that of Lithuanian when it adds the results of $*-eH$ to stems already ending in a laryngeal.

The foregoing leads me to the conclusion that the older 1st. sing. form of the Hittite preterite must simply be of the *da-aḫ-ḫu* type, the final $-n$ being an analogy of the «regular» type of conjugation, that which took in 1st. sing. $-mi$ in the pres. / $-m$ in the pret. Against pret. *da-aḫ-ḫu* < $*deHH^h_2$, the present has *da-aḫ-ḫi*, that is, originally $*deHH^h_2i$. It is the same form, not surprising in view of the fact that at a remote date when the deictic element $-i$ did not intervene, there was no tense distinction. In Baltic, present and preterite inflexions are still identical and if any distinction has been introduced it is secondary and aided by vocalic gradation and the addition of $*-eH$ to the preterite. For further details on this older inflexion in which tense is not distinguished, as on the traces it has left, I refer to my *Verbo indoeuropeo* and other papers; it is a well-known fact.

Thus, the difference between *da-aḫ-ḫ(i)* and *da-aḫ-ḫu(n)* is a purely phonetic one: before a vowel, as we shall see, the normal phonetic change is the loss of the appendix of the laryngeal. Note here that in 2nd. 3rd. sing. the pres. and preterite forms are identical, except as far as the desinence is concerned and for certain traces of $-H$ in 2nd. sing. pres. (gemination): 2nd. sing. pres. *datti*, pret. *daš*; 3rd. sing. pres. *dai*, pret. *daš*. That is, we are left with the variants *aḫ* / \bar{a} / *aḫḫu* which we expected. In order to omit nothing, we also have the form *au* without $\text{-}h$: in a pure stem, the 2nd. sing. imperative *dau*. It should be noted that in Hittite and Luvian there are traces of $\text{-}ḫu$ in the imperative.

Of course, prevocalic forms with *-āu-* are comparable, such as 1st. pl. pres. *dāuēni*, pret. *dāuēn*, inf. *dāuānzi*, of which we have yet to speak.

It is precisely these forms which recall the fact that the *-u* which was at one time considered as belonging to the aorist or perfect, was not originally this. Its use in marking these stems is a morphologization. For there is ample evidence of a *-u* < *H²) in the present: in Slavonic, Baltic, Germanic, even in Latin (*fiuo*, *uiuo*...), O. I., etc. Sometimes this is a *u* of radical origin which was kept in the whole verb; at others, certain phonetic phenomena limited it to the present (Lat. *uiuo* / *uixi*, Aes. *živq* / *žiti*); at others certain oppositions in the present stems gave a special value to *-u* in some languages (above all in Slavonic). What is clear is that these are secondary morphologizations: none of the current theories on the supposed preterite (and even causative!) meaning of the *-u* lengthening can explain this.

In any case, it is clear that the tendency was to specialize *-u* in the preterite (as, on the other hand, there was one to specialize *-i* < -H¹ in the present or in certain types of present). This was achieved at times by opposing stems, according to the norm of IE III: Lat. *nosco* / *gnōui*, *gigno* / *genui* (which reminds us that there is also CH² > Cu to mark the preterite) and identical or parallel phenomena in other languages. However, Hittite was at first content to distinguish present from preterite on the strength of the opposition *-i* / *-∅* which was redundantly combined with another of a purely phonetic origin, that of *-h* / *hu*. During a second phase it added the *-m* (> *-n*) of the *-mi* / *-m* conjugation to the preterite. It should be noted that Oscan underwent the same process: together with a preterite without desinence *subocau*, there is another with a desinence *manafum* (< **mandauum*).

To return now to the Hittite preterites in *-ahhun*, it should be added that in some of them it is possible, as has been suggested, that this is merely a spelling of *-hun*. This is probable, for example, in the case of *šaggahhun* 'I saw' (and its pres. *šaggahhi*), as the rest of the conjugation gives no hint of a full degree *eH* after the root; although it might be thought here that there is a *∅* degree °H² with developments *-ah*, *-ahhu*, which is a degree comparable to Lat. *genui*. However, in other verbs, there is clearly a full degree, that is, the interpretation I have given. I might add that sometimes *-ahhu* (and the same goes for *-ahhi*) is an addition, a morphological characteristic transplanted to several verbs without final *-H²*.

It certainly appears that, to a certain extent, Hittite advanced the IE tendency to use *u* for marking the preterite; one might interpret the occasional presence in 2nd., 3rd. sing. pret. of *-ta* in the same way.

teḫḫu(n) / daišta in effect recalls O. I. *jajñau / japñātha*, Lat. *nōu-i / nō-sti*, etc. It is not that older aorists and perfects have been adscribed to the *-ḫi* conjugation, as Risch (1975) and Eichner (1975) have suggested, neither that Hittite advanced the two-stem sytem of Latin, as González Fernández (1980) has suggested. I have criticized these opinions in «The archaic structure of Hittite: the Crux of the Problem» (forthcoming). But there was the beginning of a desinential system which was later developed in the perfect: what is stated here may be added to what is already known on the *-ḫa*, *-ta*, *-a* forms.

However, the Hittite phenomena should not be confused with those of the whole of Anatolian. This needs some explanation, with the inclusion of new data.

It is remarkable that Hittite should appear to stand alone among the Anatolian languages in this respect. The general tendency of these latter (cf. Gusmani 1964: p. 40 ff., Rosenkranz 1952: p. 75 ff., Ten Cate 1961: p. 83 ff., Neumann 1961: p. 59 ff., Carruba 1970: p. 45 ff) is to a first pers. sing. pres. in *-u*, *-v* and a first sing. pret. in *-ḫa* (Lyc. *-ka*, *-kā*, *-ga*, *-gā*). It is clear that these languages heve preserved in their preterites the older form **-H₂o*, which is present in Hittite in 1st. sing. med. pres. and pret. The change **-H₂o > -ḫa*, *-a* is an older, purely phonetic one, as we shall see. Elsewhere («Perfect, Middle Voice and Indoeuropean Endings») we have insisted that originally *-ḫa* is not related to the active / middle and present / preterite oppositions. In fact, Hittite displays a choice different to other Anatolian languages, for, as we have seen, the use of the form in *-H^h* without the *-o* thematicalization is also archaic. Hittite uses it in 1st. sing. act. pres. and pret., the phonetic opposition *-ḫ/-ḫu* being secondary as we have stated. Hittite partially specialized the *-ḫa* form in other functions.

Other Anatolian languages, as we have said, used *-ḫa* in 1st. sing. act. pret. But they maintained *-H^h* in 1st. sing. act. pres., which therefore became *-u* in Lycian, *-u* or *-v* in Lydian, *-ui* in Luwian. This latter form is obviously secondary: here the *-i* was added when a *-u* form from a pure stem already existed.

Curiously, in Lycian *-u* survived together with forms with *-i* in other persons. In any case, it should be pointed out that in Lydian there is doubt as to whether a *-vn* form is 1st. pl. pres. or 1st. sing. pret. (as Carruba (1969) believes; this would be parallel to Hitt. *-ḫun*) and that the 1st. pl. of the Hittite type *day-eni* implies a 1st. sing. *dāu* in the same way as *-meni* is construed on a 1st. sing. *-m(i)*.

All the foregoing demonstrates the usefulness of the theory of laryngeals with appendixes in the study of morphologizations and once more

shows how recent these are. The dividing line between the Anatolian languages in fact has an echo in the post-Anatolian ones. There is, in effect, a *-u* in 1st. sing. pres. in Baltic, Tocharian and Osco-Umbrian, although it is also used in the preterite (cf. *Verbo indoeuropeo*: p. 624 ff.).

It is in any case clear that, before the polythematic verbal system arose, the Anatolian languages created an opposition between present and preterite, not only on the basis of the *-i/-θ* opposition, but also on that of the oppositions we have discussed and which are formed with pure *-H²* stems, at times adding an *-o*. This was incorporated later to the new polythematic system of IE III or at least to certain languages of same.

IV. H¹ AND H² IN MEDIAL POSITION BEFORE A VOWEL OR AT THE END OF A WORD

1. *The CHV Group*:

This is the group which poses most problems from the point of view of evolutionary regularity and that which was not completely solved in my previous studies. In *Laringales* 1973: p. 288 ff., four treatments are given as phonetic. We exemplify them with *H²*:

- CH²V* > *CV* (Gr. γένος, τόμος, O. I. *mṛnanti*).
CH²V > *C_hV* (O. I. *kurvanti*, *gurvōs* from *guru-*, Lat. *ceruus*).
C^oH²V > *CauV* (Gr. κεραφός, O. I. *karāva-*, Aaa. *marawi-*).
C^oH²V > *Cu_hV* (Lat. *genui*, O. I. *dúvas*, Aesl. *bl'bnvati*).

For further examples I refer to the place quoted of *Laringales*, in which more explanations are given. Of course, the parallel treatments for *H¹* are: *θ / ĩ / aĭ / iġ*. In Hittite forms with *ḫ* (*Cḫ-* / *Cḫu-* / *Caḫu-* / *Cḫuu-* and the corresponding ones with *ḫ̄*) are found.

In *Laringales*, both in the first and second editions, all these changes are considered phonetic. That there should be monosyllabic and disyllabic treatments is certainly normal: thus in the case of initial *H_h* studied above; thus in medial groups of *C_hV* or *C_{h̄}V* which give *Cu_hV*, *C_{h̄}V* (Lat. *suus*, *siēm*); thus in the case of the labiovelar, which before *V* gives *Ku_hV* (Hittite forms *ku-ua-*, *ku-i* from *K^hV*, *a-ku-ua-an-zi*, from *ak^h* 'to drink', *ar-ku-ua-an-zi*, cf. Lat. *arguo*; *ualku_hua-* from **u_hk^hos* 'wolf', etc.); in the already discussed *uV-*, *iV-* in initial position which sometimes gives *uuV-*, *i_hV-*; in groups with other resonants of the *C^orV* type which as is known give forms of the type of Gr. πάρος alongside

those of the type Gr. *πρός*. For details see *Lingüística Indoeuropea* 1975: p. 189 ff. It is hardly justifiable that in the monosyllabic treatment H^u should either fall or give $\underline{u}V$ (and that H^i should give $\underline{i}V$). Moreover, we saw above that ${}^oH^{uo}$ gives Hittite *u \dot{h} u* only by assimilation, the regular form being *a \dot{h} u*, so one should expect only *a \underline{u}* . It should be added that in any case $u\underline{u}V$ is represented in Hittite as *u \underline{u} V* or as *h \underline{u} V* (not as *u \dot{h} \underline{u} V*).

In an «Epilogo» added to the second edition of *Laringales*, I attempted to solve part of the problem by postulating that $u\underline{u}V$ was a secondary derivate from $\underline{u}V$ ($i\underline{i}V$ from $\underline{i}V$): the regular disyllabic treatment was $a\underline{u}V$ ($a\underline{i}V$). But this did not solve the duality of the monosyllabic treatments.

I tackled this problem again in *Lingüística Indoeuropea* 1975: pp. 189 ff., 213 ff. Here I kept to the same doctrine as in the «Epilogo» of *Laringales*, but within certain monosyllabic treatments, the $C\underline{u}V$ ($C\underline{i}V$) was considered phonetic and the CV analogical, on account of morphological pressures which, on the other hand, were the reason why the laryngeal, once it had lost its appendix, did not influence the timbre of the following vowel: cf. Gr. *γένος* from $*genH^u_{10}os$ (one might have expected $*γενης$, cf. *γνήσιος* from $*gneH^u_{1-}$). It was also assumed that at other times a form of the root without laryngeal lengthening was perhaps preserved. But this latter explanation is doubtful and morphological pressure does not explain the inexistence of the expected forms $*gen\underline{u}os$, etc. The duality of treatment continues to pose problems. I wish to offer my present position on this matter below:

a) *Disyllabic treatments:*

I still consider that a change $C^oH^uV > Ca\underline{u}V$ and $C^oH^iV > CaiV$ is a purely phonetic one. We shall observe that after a vowel the appendixes of the laryngeals give the corresponding resonants (\underline{u} and \underline{i}): the same is to be expected after an anaptyctic vowel and it may also be assumed that the latter vocalizes as *a*. In short, *au*, *ai* correspond to the *au*, *ai* vocalizations discussed above and are perfectly normal. Even in the case of original $\underline{u}V$, $\underline{i}V$, there exist alongside more frequent forms $u\underline{u}V$, $i\underline{i}V$, others $a\underline{u}V$, $a\underline{i}V$, cf. e. g. Hier. Luw. *a-i-a* 'to do' together with Hitt. *i-i-a* (from $*ieH^i$); and the presence of protheses of the *ah\underline{u}V*-, *a\underline{i}V* type together with $u\underline{u}V$ - is eloquent in the sense of a double possibility which is open to the disyllabic treatments of all these groups: a vocalization or splitting of a \underline{u} , an \underline{i} or an appendix \underline{u} or \underline{i} into $u\underline{u}V$, $i\underline{i}V$.

In Anatolian examples exist which demonstrate that in the treatment $a\underline{u}V$, $a\underline{i}V$, the laryngeal was medial between the two vowels, as was to be expected after what we have learned about vocalizations. Furthermore, there are others which demonstrate that $u\underline{u}V$, $i\underline{i}V$ are developments of the appendixes, for there are $hu\underline{u}V$, $hi\underline{i}V$ as we mentioned. These are two disyllabic types which sometimes alternate with each other (cf. *araua*- 'free' and Lyc. *Aruwātijesi*, cf. Tischler 1977:54). I believe that both are phonetic and two different solutions to the same problem.

We have seen that $u\underline{u}V$, $i\underline{i}V$ is a constant in IE. In Anatolian this happens to such an extent that *aśva*- 'horse' from O. I. is transcribed as Hier. Luw. *aśuua*-. Moreover, an extremely common Anatolian type is that which offers both resorts at the same time, that is, there is an *a* vocalization and a $u\underline{u}$ or $i\underline{i}$ development of the appendix before a vowel. There is, however, a further point to note and that is the existence of $\underline{u}V$, $\underline{i}V$ forms with a \underline{u} or \underline{i} glide. This is doubtless a graphic problem: the syllabism is the same. See Neu (1970: p. 53) on the archaic nature of this spelling, Mittelberger (1964: p. 77) on graphic problems of this type of hieroglyphic Luw. This solution seems to be more acceptable than Kronasser's (1966: p. 75), who, following Sturtevant, suggests with great vacillation that these are perhaps spellings of $C\underline{u}V$, $C\underline{i}V$. This is totally implausible for this treatment hardly exists in Anatolian.

We have already mentioned above a vacillation *danattaḫuwanzi* / *tannatauwanzi* as likewise the *ḫ* of the *-ai* verbs (*iṣḫuua*-, *iṣḫui* 'to throw', *iṣḫiia*- 'to tie'). Forms of the 1st. pl. such as *tarḫuen*, alongside which there is an adjective *tarḫuili*- 'strong' (and forms of \emptyset degree such as *tarḫuzzi*) are also interesting. One should also mention again the root *tuḫš*-, *tuḫu*- 'incense' of which a form *daḫuš*- is known and, before a vowel, *tuḫueššar*, etc. (and also *tuua*-). Perhaps more remarkable is *la-ḫu*- 'to wash', cf. Lat. *lauo*, Gr. $\lambda\omicron\phi\acute{\epsilon}\omega$, of which Kronasser (1966: p. 79) gives a long series of forms with *-ḫuV*, *-ḫu-u-V*, *-ḫu-u-V*, *-ḫu-u-u-V*, but none with *-ḫ-uV*.

In other instances, the laryngeal origin of $u\underline{u}$, $i\underline{i}$ is displayed by alternation with forms with *ḫ* or with others in which a long vowel or some other factor bears witness to the former presence of a laryngeal. Above all, there are very clear examples of an *ḫ* treatment of *H* before a vowel alternating with $u\underline{u}V$, $i\underline{i}V$: cf. e. g. *palḫatar*, *palḫašti*- 'width' together with *palḫi* (Gen. *palḫiias*) 'wide'; *tuḫalzi* 'sacrifice' together with *tuḫueššar* (a substance used in sacrifices); *teḫḫi* / *tiianzi*, *tiiami* (together with many verbs of this type); *arḫi* 'to arrive' / Luw.

ariia-, cf. Lat. *orior*; Pal. *marḫant / marḫiia* 'to break'; verbs in which *-aḫ-* and *-uḫV* alternate, perhaps *arranzi / arruḫanzi* (with assimilation of *rH*). At other times, *uḫV* or *iḫV* alternate with forms in which the *ḫ* has been dropped: thus in the case of abstracts in *-atar*, *-ašti*, *-eššar* alongside forms with *-uḫV*, *-iḫV*: *anna* 'mother' / *anniḫatar*, etc. It is perfectly normal to derive forms with *iḫ* from *-a*, *-i* and with *-uḫ* from *-ḫ*, although later they spread as simple derivatives. One should bear in mind nominal forms too, such as *zahḫaiš / zahḫiiaš*, as well as verbal ones such as some of those we mentioned above, and as *ua-al-aḫ-mi / ua-al-ḫu-ua-ni*, *arnumi / arnu(u)anzi*.

In fact, in Anatolian morphological characteristics already exist of the types: *iḫa* (in nouns and adjectives, also in nominal inflexion; in verbal inflexion), *-uḫa* (above all in the verb: 1st. pl. inf., verbal noun, supine). These were widespread outside their places of origin. But only rarely do *-ia*, *-ua* appear, except when they come after a vowel; after a consonant, to the extent to which these forms exist, they are doubtless re-contrued forms derived from those we have just mentioned. The groups *CuḫV*, *CiḫV* in reality barely exist in Anatolian, except in rare words without IE etymology (Hitt. *alḫanza-*, *arḫanalli-*, *ḫalḫani-*...) and in others in which they are, as we stated, suffixes or morphological characteristics.

It is true that in other IE languages, above all in Gr. and O. I., the groups *CḫV*, *CiḫV* are frequent; even more common is the fact that the *CuḫV*, *CiḫV* groups predominate, as in Latin and Slavonic. I believe that the monosyllabic forms with *CḫV*, *CiḫV* must be an analogical generalization, thus in O. I. *ari-* / *aryas*, *guru-* / *gurvōs*, *kṛṇoti* / *kṛṇvanti* (but cf. Gr. **-ḫonti*). The question certainly requires further study: but *CaḫV*, *CuḫV* and the symmetrical *H¹* forms are justifiable; *CḫV*, *CiḫV* do not appear to be this.

b) *Monosyllabic treatment.*

Thus the only monosyllabic treatment which is left as an original is that which concerns the loss of the appendix. We have already given Anatolian examples of *-ḫV* and other post-Anatolian ones of *-θV*. We would add the treatment which in several languages leads to the creation of a series of aspirated voiceless occlusives from *CH* (Villar 1971).

In actual fact, this was exactly the treatment to be expected, for it is parallel to that of *HV-* in initial position. However, not only has the appendix been dropped, but very often the timbre of the laryngeal has left no trace either: we have already given examples of this with Gr. γένος, τόμος. Obviously, the morphological pressure of the pre-

desinential vowel and the thematic vowel has had great effect. This occurs both in Anatolian and in post-Anatolian. However, there is no lack of examples to the contrary. Thus, there is the middle and perfect desinence $*-H_2o > -a$, cf. also the 2nd. sing. $*-H_2to > *-tH_2o > *-tHa > -ta$. According to my theory, on the other hand, it was lost at an early stage in order to draw a morphological distinction to the $-H_2$ of the 1st. sing. There is nothing odd in the fact that the lost laryngeal does not influence the timbre of the vowel, $-e$ in post-Anatolian (in Anatolian it is $-a < *o$).

2. The VHV Group.

Finally, the VHV group has results which in general terms are comparable to those of the VRC group with vocalization which we have already studied. To give examples of eH^2V we get:

1. Solution without gemination:
 $-eH^2V > -e\mu V$ (Anat. $-e(\hbar)\mu V$).
2. Solution with gemination:
 $-eH^2V > -\tilde{a}\mu V$ (Anat. $-a\hbar\mu V$).

It is quite logical that in the first case there should be no lengthening or change of timbre of the vowel and in the second that both phenomena should occur. There are abundant examples: these are always full degrees which alternate with \emptyset degrees of the types we already know: cf. e. g. Gr. $\nu\epsilon\phi\omega$ together with $\nu\tilde{\alpha}\phi\acute{o}\varsigma$ from $*neH^2$, O. I. $g\tilde{a}vas$ / Gr. $\beta\acute{o}\phi\epsilon\varsigma$, Lett. $d\tilde{e}ju$ 'to suck' / O. I. $dhayati$, O. I. D. sing. $praj\tilde{a}yai$ / I. $prayaya$, O. I. $d\tilde{a}vane$ / Gr. $\delta\omicron\phi\acute{\epsilon}\nu\alpha\iota$. For further examples I refer to my other publications. Naturally, full degrees with simple long vowels alternate (Gr. Ac. $\nu\tilde{\alpha}\nu$, N. $\beta\tilde{\omega}\varsigma$, O. I. $praj\tilde{a}$, Gr. $\delta\iota\delta\omega\mu\iota$ (cf. also the types O. I. $dh\tilde{i}-s$ / $dh\tilde{i}yas$, $bhr\tilde{u}-s$ / $bhr\tilde{u}vas$). There are also \emptyset degrees of the types already studied.

In Hittite we find corresponding forms with direct traces of the H: D. L. $me-\hbar u-e-ni$, 2nd. sing. pret. $pur-ta(\hbar)-\hbar i-i\tilde{s}(-ta)$. It is more frequent for \hbar to be missing: thus in 1st. pl. pres. $d\tilde{a}uen$ from $dah\hbar i$ and in diverse verbal formations already mentioned above.

In any case, if there is no doubt that, in post-Anatolian IE, the type $-\tilde{a}\mu V$, $-\tilde{a}\tilde{i}V$ and parallel forms of other timbres, as likewise those with a short vowel ($-e\mu V$, $-e\tilde{i}V$), are absolutely regular, the same does not occur with Anatolian. In fact, in post-Anatolian, forms in which the laryngeal appendix has been dropped are hard to find; certain of these which have been suggested, such as a G. sing. $*-\tilde{a}-es > -\tilde{a}s$, are not at all certain (it may be an ancient $-\tilde{a}-s$).

As far as Anatolian is concerned, we know of forms with *-abhā-* which, if they on the one hand prove gemination of the laryngeal, on the other display loss of the appendix. We already know that *hh* and *h* alternate; this offers valid confirmation of our theory. A word *lahhas* 'war' comes from **leH₂H₂* both in the case that it is connected with Gr. λαῖφός and if connected with Gr. δᾶφι, as Gusmani believes (1968); cf. also Hitt. *huhhas* / Lat. *auus* and several other previously given examples.

Once again, we come to the conclusion that Anatolian did not always represent an older stage than post-Anatolian (or IE III). There are occasions when both have inherited the same laryngeal, which then evolved in a parallel way in both groups, but with certain innovations in one and the other. In Anatolian, the laryngeals lasted longer; but the laryngeals with appendix came down to IE II, to judge from the partially independent morphologizations. Once it became isolated, Anatolian sometimes developed independent innovations. In the present case, it appears that it tended to follow the parallelism of the *CHV* treatment, with loss of the appendix. On the other hand, as we have seen, Anatolian was more conservative in other points, such as that which concerns the scant development of a *C₂V*, *C₁V* group and in general terms in its morphology.

V. CONCLUSIONS

We have drawn up herebelow a table of the main results of the evolution of the laryngeals. The main consequences are: there are only laryngeals with appendix and not without, although under certain circumstances the appendixes have been dropped; evolution is regular but experiences fluctuations caused by changes of syllabic boundary, by geminations of *H* and by the influences of context on timbres of vocalizations; the results of the laryngeals are morphologized and spread from IE II onwards, although IE III displays its own innovations.

Phonetically, the general lines of evolution are common to all IE, but certain differences are to be noted, which we have already mentioned. Besides the last ones quoted, we would point out as far as IE III is concerned those connected with compensatory lengthenings. Thus, the case of *H^u > ū* and the parallel of *i*.

The following table gives the fundamental phonetic contexts which produce their own phonetic treatments. We shall disregard the *RH* group (resonant + laryngeal), that is, the treatments *H₂V > (a)(h)₂V*,

(a)(h)uuV; CrHC > ar, ra, ara, rā in several languages (data are missing in Anatolian); CrH²V > CūruV, CrāV also according to the different languages (same remark as above), among others. We shall merely attempt to give a synoptic image of the regular phonetic treatments according to the phonetic contexts and the problems of syllabic boundary, gemination and vocalization. We exemplify with the laryngeals H² and H¹ and the vowels e before, o after same. It is easy to construe parallel tables for the other laryngeals and vowels.

SYNOPSIS OF THE EVOLUTION OF H² AND H¹ IN INDOEUROPEAN

I. In initial position.

H ² o-	}	>	H ₂ o-	>	a ⁻¹
H ¹ o-			[an. (h)a-]		

II. In positions before a consonant or #².

IE	Vocalizations ³		Consonantic H
1. CH ² C	CH ² oC > ū [an. (h)u]	C ^o H ² oC > au [an. a(h)u] ⁴	} CHC > ø [an. (h)]
1. CH ¹ C	CH ¹ oC > i [an. (h)i]	C ^o H ¹ oC > ai [an. a(h)i]	
2. eH ² C	e-H ² oC > eu [an. e(h)u]	eH ₂ H ² oC > āu [an. a(hh)u]	} eH ₂ C > a ⁵ [an. a(h)]
2. eH ¹ C	e-H ¹ oC > ei [an. e(h)i]	eH ₂ H ¹ oC > ai [an. a(hh)i]	

¹ Remember the occasional analogical preservation of the timbre of the vowel.

² In our table, C indicates both the consonant and the juncture at the end of a word.

³ As far as IE III or post-Anatolian is concerned, the compensatory lengthenings which produce ū, ī (apart from those of the RH group, not given in the table), should be added.

⁴ I do not insert the eventual gemination of h, except when this is reflected by lengthening.

⁵ A syllabization e-H²C with the result e is very rare.

III. In positions before a vowel.

IE	Disyllabic treatments		Monosyllabic treatments
1. CH^u_2o	$C^o-H^u_2o > a\underline{u}o$ [an. $a(h)\underline{u}a$]	$CH^u_2o > u\underline{u}o$ ⁶ [an. $(h)u\underline{u}a$]	} $CH_2o > a$ ⁷ [an. $(h)a$]
1. CH^i_2o	$C^o-H^i_2o > a\underline{i}o$ [an. $a(h)\underline{i}a$]	$CH^i_2o > i\underline{i}o$ [an. $(h)i\underline{i}a$]	
2. eH^u_2o	$e-H^u_2o > e\underline{u}o$ [an. $e(h)\underline{u}a$]	$eH_2H^u_2o > \bar{a}\underline{u}o$ [an. $ah\underline{u}a$] ⁸	
2. eH^i_2o	$e-H^i_2o > e\underline{i}o$ [an. $e(h)\underline{i}a$]	$eH_2H^i_2o > \bar{a}\underline{i}o$ [an. $a(hh)\underline{i}a$]	

If we now relate the total of the results with the vowel degrees, we get:

Full	Zero
$eH^u_2 > \bar{a} / \bar{a}u / eu$	$H^u_2 > \emptyset / \bar{a} / \bar{u} / au$
$eH^i_2 > \bar{a} / \bar{a}i / ei$	$H^i_2 > \emptyset / \bar{a} / \bar{i} / ai$

The \bar{u} of Anatolian is not given here, neither are marginal or analogical treatments mentioned above.

Morphology is certainly the greatest support of the whole theory; it is this, in fact, which determines when there are cases of full or zero degree. Alternations of the $\bar{e}i / ei / i$ type in which an etymological, and non-laryngeal i intervenes are not comparable (as likewise in the case of u), thus, e. g. in $*leik^u$ 'to leave'. In effect, $\bar{e}i$ is here a lengthened degree (*Dehnstufe*) in a form such as O. I. *araiḫsam*, and not a full degree as the long diphthongs derived from the laryngeal. This lengthened degree is a recent one. It is on the other hand easy to distinguish the series of alternations derived from the laryngeals and those derived from u, i , independently of morphology and vocalic degree. In the laryn-

⁶ I have not collected marginal or innovating forms $au\underline{u}o, \underline{u}o$ and the parallels of H^i .

⁷ There is very often analogical preservation of the timbre of the vowel.

⁸ Anatolian most frequently generalizes an analogical treatment $ah\underline{u}a$, with loss of the appendix.

geal series, there are occasional changes of timbre and alongside the long diphthongs there are long vowels (\bar{a} alongside $\bar{a}i$). The conditions which explain the different forms are, on the other hand, quite different: they are of a phonetic type and not of a morphological one, except as far as the full / \emptyset opposition is concerned.

We believe that the foregoing pages — together with the paper «More on the laryngeals with labial and palatal appendixes» — will have accounted for a series of facts that were certainly not sufficiently explained in my former papers. The fundamental point is that of the regularity of evolution within a series of principles conditioning phonetic evolution in several ways. But we have also studied a series of details and problems which might hinder a global vision of the subject. On the other hand, I believe that new data and observations on IE morphology as far as it uses laryngeal lengthenings, suffixes and endings, may be of use both for the understanding of said morphology and for the laryngeal theory.

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